

CROSS-COMPLIANCE  
No. SSPE-CT-2005-006489  
Deliverable number: 5  
01 March 2007



**Project no. SSPE-CT-2005-006489**

## **CROSS-COMPLIANCE**

### **Facilitating the CAP reform: Compliance and competitiveness of European agriculture**

**Specific Targeted Research or Innovation Project (STREP)  
Integrating and Strengthening the European Research Area**

**Deliverable 5: Mandatory standards in 7 EU countries and 3 non-EU  
countries**

**Country Report Netherlands**

**Due date of deliverable: April 30, 2006**

**Actual submission date: 01.04.2006**

**Start date of project: May 1, 2005**

**Duration: 30 months**

**Organisation name of lead contractor for this deliverable: CRPA**

**Nature of the deliverable: PU**

Authors of this report and contact details

Name:

Roel Jongeneel  
Floor Brouwer

Partner acronym: LEI  
Partner acronym: LEI

Address:

Burgemeester Patijnlaan 32, Den Haag  
Email: [roel.jongeneel@wur.nl](mailto:roel.jongeneel@wur.nl)

Acknowledgement: For this reason several experts of the Ministry of Agriculture, Nature and Food Safety, Product Boards, Water Board, AID Inspection agency, Farm Unions (LTO, NMV, NAV), researchers and farmers were interviewed. We thank them for their cooperation and willingness to share their knowledge.

Disclaimer:

“This publication has been funded under the CROSS-COMPLIANCE project, EU 6th Framework Programme, Priority 8.1 (European Commission, DG RTD, contract no. SSPE-CT-2005-006489). Its content does not represent the official position of the European Commission and is entirely under the responsibility of the authors.”

"The information in this document is provided as is and no guarantee or warranty is given that the information is fit for any particular purpose. The user thereof uses the information at its sole risk and liability."

<b>Project co-funded by the European Commission within the Sixth Framework Programme (2002-2006)</b>		
<b>Dissemination Level</b>		
<b>PU</b>	Public	XX
<b>PP</b>	Restricted to other programme participants (including the Commission Services)	
<b>RE</b>	Restricted to a group specified by the consortium (including the Commission Services)	
<b>CO</b>	Confidential, only for members of the consortium (including the Commission Services)	

## Contents

<b>Executive summary</b> .....	<b>5</b>
<b>1 Introduction</b> .....	<b>6</b>
<b>2 National context: agricultural production conditions and policy implementation</b> .....	<b>7</b>
2.1 <i>Brief historical background</i> .....	7
2.2 <i>Current situation</i> .....	11
2.3 <i>Policy implementation: general approach</i> .....	13
<b>3 Environment</b> .....	<b>15</b>
3.1 <i>Statutory Management Requirements</i> .....	15
3.1.1 <i>Birds and Habitat Directive</i> .....	15
3.1.2 <i>Protection of groundwater</i> .....	19
3.1.3 <i>Sewage sludge directive</i> .....	20
3.1.4 <i>Nitrate directive</i> .....	21
<b>4 Identification and registration of animals</b> .....	<b>24</b>
4.1 <i>Identification and registration of bovine animals</i> .....	24
4.2 <i>Identification and registration of ovine and caprine animals</i> .....	25
<b>5 Public, animal and plant health</b> .....	<b>26</b>
5.1 <i>Plant protection products</i> .....	26
5.2 <i>Food traceability systems/matters of food safety</i> .....	27
5.3 <i>Hormones and beta-antagonists</i> .....	27
5.4 <i>Notification of diseases</i> .....	28
<b>6 Animal welfare</b> .....	<b>29</b>
6.1 <i>Housing of calves</i> .....	29
6.2 <i>Housing of pigs</i> .....	30
<b>7 Good agricultural and environmental condition (GAEC)</b> .....	<b>31</b>

<b>8</b>	<b>Survey approach</b> .....	<b>32</b>
8.1	<i>Introduction</i> .....	32
8.2	<i>Survey</i> .....	33
8.3	<i>General results</i> .....	34
<b>9</b>	<b>Estimated degree of compliance</b> .....	<b>35</b>
<b>10</b>	<b>Estimated costs associated with cross compliance regulations</b> .....	<b>39</b>
10.1	<i>Introduction</i> .....	39
10.2	<i>Birds and Habitat Directive</i> .....	40
10.3	<i>Groundwater protection Directive</i> .....	40
10.4	<i>Sewage Sludge Directive</i> .....	41
10.5	<i>Nitrate Directive</i> .....	42
10.6	<i>Identification and registration of animals</i> .....	45
10.7	<i>Public, animal and plant health</i> .....	47
10.8	<i>Animal welfare</i> .....	47
10.9	<i>Good agricultural and environmental condition</i> .....	47
10.10	<i>Concluding remarks</i> .....	48
<b>11</b>	<b>Estimating benefits of cross compliance</b> .....	<b>48</b>
<b>12</b>	<b>Inspection and enforcement</b> .....	<b>49</b>
<b>13</b>	<b>Concluding remarks</b> .....	<b>56</b>
	<b>References</b> .....	<b>57</b>

## Executive summary

This report provides an overview of the implementation of all the SMRs and GAECs included in the cross-compliance package into national Dutch law. It also tries to give a brief background about national agricultural and policy context, which contributes to understand the peculiarities of the Dutch situation (in particular with respect to the recent changes in the manure application legislation).

Two important other issues discussed are the degree of compliance and the costs of compliance. With respect to the degree of compliance three approaches could be followed, which were all exploited in this study. Unfortunately the information of these different sources was not easy to compare, and did not allow for definite conclusions about the degree of non-compliance. However, it provided insight into the variation of the compliance estimates and the need to use cross checks.

There was evidence from the survey signalling that cross-compliance was effective in that it improved the degree of compliance and stimulated farmers to increase their efforts to achieve compliance. Also evidence was found that farmers 'fear' the official inspections and would really like to avoid detected deviations (and the associated sanctions).

With respect to the costs of compliance, both the information from the survey as separate ex-ante studies and normative farm specific cost studies were exploited. For each SMR costs estimates are provided. As far as calculations about total costs are given they need to be multiplied by the percentage of non-compliance to arrive at an estimate of additional costs.

Although uncertainties remain and some kinds of information was lacking, it is clear that for the Netherlands the main directive leading to additional costs is the Nitrate Directive. This cost increase is due to the recent changes in the legislation in this field made by the Dutch government in order to achieve macro compliance (the old MINAS manure legislation appeared not to satisfy EU requirements).

The second SMR which farmers ranked to be most difficult to satisfy was the identification and registration requirement.

# 1 Introduction

This report firstly describes the national implementation of cross compliance in the Netherlands. Alongside issues of implementation, research was done with respect to the degree of compliance and the costs of compliance. Estimates of this are based on specific research studies, as well as on an extensive empirical research among farmers, which included a structured survey among about 1600 dairy, beef, intensive livestock and arable farmers in the Netherlands, as well as 4 focus group session held in the north and the south of the country.

Section 2 provides an introduction to the current situation of agriculture in the Netherlands, which emphasizes the relative intensive way of agricultural production as compared to nearly any other EU member state. This description helps to put the impact of cross compliance in the Netherlands into its context. In particular the sectoral evolution of the dairy-beef complex, the arable complex and the intensive livestock complex are sketched. A complex not only regards primary agricultural production, but also includes directly related downstream and upstream industries (product or market chain). The complex- or chain-perspective is important because of several reasons, among which competition, certification systems, marketing and branding including references to the way in which the primary sector generates its produce (for the sake of convenience a detailed discussion of certification and quality guarantee-systems is presented in a separate deliverable).

Sections 3, 4, 5 and 6 provide an overview of the mandatory standards valid in the Netherlands which derive from the statutory management requirements of the 19 EU Directives and Regulations relevant for CC. The standards described in these sections are those laid down in the checklists and information material provided to farmers by the Dutch Ministry of Agriculture (see also Section 10). These documents comprehensively list the constraints farmers face if they want to comply with all standards that are relevant for cross compliance. By systematic controls only a limited set of control criteria and indicators is controlled by the authorities, however the full account of standards is relevant to farmers since infringement may also be discovered during Cross Checks (see Section 10).

Section 7 discusses the requirements with respect to keeping the soil into good agricultural and environmental condition (GAEC).

With regard to the degree of compliance data availability is scarce. Therefore it was decided by the Dutch team to generate primary data by a combination of an extensive survey and 4 focus group sessions. Where possible the information is cross checked with information from other sources (e.g. information from the AID, the inspection agency of the Dutch government). Based on this work estimates on the degree of compliance (detailed at SMR regulation level) as well as on costs are provided. In the survey, not only information about degree of compliance and costs are asked, but also a number of questions are included which regards the perceived benefits of the cross compliance conditions on the environment, the soil condition, food safety and animal welfare.

Section 8 outlines the survey approach. Detailed results on the degree of compliance are the subject of Section 9. Estimates about the costs involved with cross compliance are provided in Section 10. Section 11 discusses the perceived benefits of the imposed cross compliance conditions.

A separate section is devoted to the Dutch inspection and enforcement system (Section 12).

Finally, this deliverable closes with a concluding section (Section 13), which tries to integrate the results found at several areas, and put them in perspective (in relation to finding of the literature, and results found for other countries).

## **2 National context: agricultural production conditions and policy implementation**

In several respects Dutch agriculture has a somewhat special position within the European whole. The special characteristics are relevant for understanding the impact, costs and benefits, which are expected to result from imposing cross compliance. In this section therefore a general overview of the characteristics of Dutch agriculture is given, with a special emphasis on the arable, dairy and beef and intensive livestock sectors (see Section 2.2). The latter are focus sectors for the analysis of the impact of cross compliance (See Deliverable D7).

For completeness a short overview of past developments is sketched, which not only helps to highlight the high intensity of Dutch agricultural production, but also makes clear how past trends are changed due to an increased attention for issues, which are subject of the cross compliance regulations and requirements (see Section 2.2).

Finally in Section 2.3 a general introduction is given about how the cross compliance regulations are implemented in the Dutch context. This regards mainly the general policy philosophy; specific details are left for other Chapters.

### **2.1 Brief historical background**

The Dutch agricultural sector (including horticulture) has been experiencing a tremendous development since the World War II. As Table 1 shows, since the 1950s gross output has increased with a factor 4.4, whereas the input of labor and land declined with 36 and 16 percent respectively. In general output growth was strongest in those sectors where production was not or only loosely tied to land (pigs, poultry). The input of capital and purchased inputs (e.g. energy, fertilizer, animal feed produced elsewhere, services) increased with a factor of 2.4 and 5.0 respectively. Since the mid-1980s the amount of purchased inputs more or less stabilizes (suggests partial decoupling).

Over the period 1950-2000 the number of farms has decreased with 218 thousand, or about 70%. At the same time gross output per farm increased with a factor 14.4, whereas the volume of capital input (excluding the value of land) and land used per farm increased with a factor of 8.0 and 2.6 respectively. As is reflected by output per hectare and the use of purchased inputs per hectare, agricultural production greatly

intensified. Because the output growth exceeded domestic demand growth, the reliance on exports of Dutch agriculture increased over time. At his moment about 75% of the value added of the sector depends on exports, whereas 30 years ago this was less than 60% (Van Bruchem, 2001).

In the following the focus is on arable and animal (meat and dairy) production (excluding horticulture). The growth of livestock production has been much higher than arable production. Whereas land-based outputs (arable crops and dairy production) roughly tripled in the period 1950-96, production of the livestock sector in 1996 was nearly six times as large as in 1950. Since the late 1980s all outputs are stabilizing. In the dairy sector, where a quota system was introduced in 1984 output has actually declined during the last considered decade. Although the livestock sector (meat) is subject to a relatively light CAP support regime, it has shown a tremendous growth. The shares of arable, meat and milk in the total gross agricultural output value in 1995 are respectively 14, 63 and 23 percent, which underscores that Dutch agriculture is particularly strong in animal production (total output value share 86 percent).

**Table 1.** Structural development of Dutch agriculture 1950-2000

	Unit	1950	1960	1970	1980	1990	2000
Number of farms	x1000	315	284	185	145	125	97
Labor	1000 AJE	550	437	290	235	215	198
Land	x 1000ha	2328	2317	2143	2020	2006	1956
Capital	index	100	103	129	178	196	237
Purchased inputs	index	100	189	302	453	491	496
Gross production	index	100	141	206	317	408	442
Labor/farm	AJE/farm	1.75	1.54	1.57	1.62	1.72	2.04
Land/farm	ha/farm	7.4	8.2	11.6	13.9	16.0	20.2
Output/farm	index	100	156	350	688	1031	1438
Capital/farm	index	100	119	226	404	512	798
Output/ha	index	100	141	223	363	472	524
Purchased inputs/ha	index	100	189	328	521	568	591

Source: Van Bruchem (2001).

With respect to the input side, labor input has been substantially reduced. For hired labor the decline took largely place in the period 1950-1973, after which it stabilized and since the mid-1980s even slightly starts to increase again. In contrast, family labor shows a continuous decline, which since the late 1980s outpaces the hired labor decline. The amount of aggregated output per unit of aggregated labor showed a strong and steady increase since the early 1960s, with the 'labor productivity' in 1996 being nearly 12 times as large as in 1950. The decline of labor input (aggregate labor input declines by 62%) was compensated for by an increase in the input of capital. The capital stock increased with 110% in the period 1950-1985, after which it started to slowly decline.

Fertilizer input showed a strong increase in the period 1950-1985 (+115%), but a strong decline thereafter. The level of (total) fertilizer input in 1996 was only 1.4 times as large as in 1950. Fertilizer use per unit of output was more or less stable over the period 1950-1967, but started to decline thereafter. In 1996 the amount of fertilizer used per unit of output was 63% below the 1950-level. The use of fertilizer

per unit of land (arable and pasture) increased in the period 1950-1983 (+176%), after which it started to decline (1983-1996: -40%). The strong increase in the intensive livestock production and its heavy reliance on purchased compound feeds, is reflected in the feed use, which in 1985 and 1986 was more than ten times as large as in 1950.

The quasi-fixed land input is rather stable and slowly declining over time. In 1996 it has declined by 17 percent as compared to 1950. Land productivity substantially increased: over the period 1950-1996 the arable output per unit of arable land and the dairy output/unit of grassland increased by 260 and 300 percent respectively.

Table 2 provides an overview of the Nitrate and Phosphate balance of Dutch cultivated land, including contributions from organic manure as well as from chemical fertilizers. Table 2 confirms Table 1 in that it shows that the output and productivity growth was realized by an increase reliance on the use of fertilizers per hectare. However, as Table 2 also shows, past trends have been bowed downward since the 1990s for Nitrate fertilizer, and already since the 1980s for phosphorous fertilizers.

**Table 2** Nitrate and Phosphorous fertilizer balances for Dutch agriculture

	1970	1980	1990	2000	2003 (estim)
Kg N/ha					
supply total	332	447	459	394	343
- organic manure	133	190	239	205	177
- fertilizer	185	240	201	169	147
use	167	210	248	212	198
difference S-D	165	237	211	182	145
index 1970=100	100	144	128	110	88
Kg P <sub>2</sub> O <sub>5</sub> /ha					
supply total	135	160	153	125	104
- organic manure	80	115	108	87	72
- fertilizer	50	39	37	32	27
use	50	66	71	68	64
difference S-D	85	94	82	57	40
index 1970=100	100	111	96	67	47

Source: Landbouw-Economisch Bericht (various years)

The use of plant protection products has been halved in the period 1985-2000. However, since then the application fluctuates around 9.5 million kg, without showing a significant downward trend (Silvis and De Bont, 2004, 58). There is a strong variation in chemical application over crops. For cereals and sugarbeets the use is usually somewhere in the range of 3-5kg/ha. For potatoes, onions, vegetables and

fruit the application level varies between 10-20kg/ha, whereas for flowers applications vary between 20-60kg/hectare.

The efforts to reduce the harm to the environment from agriculture are not without costs. Table 3 gives an overview of the gross environmental costs. As the Table shows the abatement costs show a strong increase over time. From 1990 to 2003 the gross abatement costs increase from €147 million to €680 million in 2003, which implies an annual increase of 12.5%. For the net abatement costs the growth rate is only slightly lower (11.6%), indicating that government subsidies (for example on manure storage facilities) hardly affected the trend in the evolution of costs.

**Table 3** Environmental or abatement costs of Dutch agriculture (1990-2003)

Year	Gross costs	Of which Manure & Ammonia	Subsidies	Net costs	Idem as % of GVA
1990	147	100	23	124	1.3
1991	1186	116	26	160	1.7
1992	283	168	28	254	2.7
1993	272	195	52	220	2.6
1994	298	217	46	251	2.8
1995	277	211	38	240	2.6
1996	267	192	40	226	2.5
1997	291	208	41	250	2.8
1998	328	212	56	272	3.0
1999	437	264	99	337	3.9
2000	528	309	132	396	4.3
2001	580	313	159	421	4.4
2002	620		160	460	5.1
2003	680		160	520	5.7

Source: Landbouw-Economisch Bericht 2005, 86.

Concluding it can be said that the labor and land productivity of Dutch agriculture are high and belong to the highest ones of the EU-25. This goes together with a very intensive way of production characterized by a strong reliance on non-factor inputs (imported feedstuffs, plant protection products, fertilizers). Today Nitrate losses are substantially below 1970-levels, and even much lower when compared to the situation in the 1980s. Irrespective of the declining trend, Dutch Nitrate losses are still about 3-4 times as high as the EU-15 average. The use of chemicals per hectare in the Netherlands is about 2.5 times as high as the EU-15 average. Although the use per

hectare of both fertilizers and chemicals is relatively high when compared to other EU member states, the use per kilogram of produced output is often lower than elsewhere. Finally, most intensive chemical applications are with crops which receive a low degree of price support.

## 2.2 Current situation

Whereas the previous paragraph showed some stylized figures about past trends, this section goes more in detail about the current situation, with a particular focus on the arable, dairy and beef and intensive livestock complexes. Subjects that are discussed include population density and societal wants, the importance of agriculture for the Dutch economy (income, employment) and trade balance (net exports and competition), policy-orientation and policy dependence.

It is good to realise that The Netherlands is a country with a very high population density (452 inhabitants/km<sup>2</sup>, or 16 million people on a surface of 34000 square kilometres). This implies a strong connectedness between urban and rural areas, with often diffuse borders. It also implies that agriculture is faced with relatively strong demands from society, because all these people have their wants with respect to living, recreation, enjoying landscape, etc. This is even more so because the people are relatively wealthy, and therefore the demands for such ‘luxury’ goods show a relatively strong increase (high income elasticity). There are a host of EU and non-EU arrangements aiming to encourage or enforce agriculture to address these ‘new’ wants and provide new services alongside traditional outputs.

The composition of the product mix of Dutch agriculture is given in Table 4. As Table 4 shows the animal sector and horticulture are dominating the scene, where in particular the latter sector is operating without any support from the common agricultural policy (CAP). Within the arable sector the high share of root crops relative to cereals is characteristic for the intensity of production also there. Within horticulture the magnitude of the ornamentals and flowers branch is remarkable. Within the animal product group the importance of dairy and the intensive livestock sector are evident. Whereas the dairy sector is land-based and draws form policy support, the intensive livestock sector is land-lose and only covered with a lightly structured policy support regime within the CAP.

**Table 4** Product mix composition Dutch agriculture, 2004 (million euro’s)

	2004	%
Arable	2695	13.8
Cereals	248	1.3
Rootcrops	1063	5.4
Other	1384	7.1
Horticulture	7217	36.9
Vegetables	1710	8.7

Fruit	459	2.3
ornamentals and flowers	5048	25.8
animal products	7672	39.2
Dairy	3383	17.3
Beef	1324	6.8
Pigs	1933	9.9
Poultry	426	2.2
Eggs	295	1.5
other animal products	311	1.6
agricultural services	1965	10.1
Total	19549	100.0

Source: calculated from Landbouwcijfers, 2004, 160

The agricultural business complex, which includes primary production as well as the activities of upstream and downstream industries, creates employment for about 650.000 persons. This is about 10% of total employment in the Dutch economy. The share of the agribusiness complex in the earned gross domestic products is also about 10%. In the period 1995-2000 this share declines from 12% to 10%, in spite of the growth of its total gross value added from €32.3 billion to €41.8 billion (+29%). In other words, the growth rate of the rest of the economy outpaced the income growth in agriculture, therewith reducing its relative income share.

Together with the US and France, the Netherlands is in the world's top-3 group of net exporters of agricultural and food products. Given its small surface and high population density this is a remarkable achievement. Ornamentals, meat, dairy and vegetables are the dominant export products (share in total exports about 75%). As compared to in particular the US the Dutch mix of export products are relatively high value added products (France has an intermediate position). About 80% of the Dutch agricultural exports go to other EU member states, with neighbouring countries Germany and Belgium and also France as main destinations. Outside the EU the US, Russia, Japan and Swiss are important destinations of Dutch exports. Competitiveness, innovation, investment in knowledge intensive high quality products, efficiency in marketing and distribution logistics are catchwords to compensate for the relatively high production costs (scarce labour and land) and to preserve and develop the Dutch position in international trade. Although the Netherlands still has a strong competitive position it lost some ground as compared to the export growth rates realized by Germany (processed potatoes, dairy), Italy, Spain (vegetables) and Denmark (pig meat).

As noted before, the heavy reliance on export markets makes that Dutch agriculture faces a relatively intensive international competitive pressure. At the same time agriculture's main production factors (labour and land) are scarce, whereas there are increasing demands from society requiring agriculture to cope with environmental, landscape, and animal welfare issues and operate in a responsible and sustainable

way. As mentioned in the previous section, Dutch agriculture made already a significant effort in reducing harmful effects to the environment, notably with respect to the use of chemicals, fertilizers and manure. However, still the negative impacts of agriculture on the environment are significant.

The reduction of the nitrate loss (e.g. Table 2 the supply minus use difference) has led to a reduction of the Nitrate-level in the top layer of the groundwater table. For the clay and peat soils the concentration is lower than the EU-norm of 50 mg/litre (MNP, 2005). For the sandy soils, however, the concentration-level is about 90 mg/litre, which is still far above the EU norm. Although also there a substantial reduction was achieved in the past decade (it declined from 135mg/liter in the early 1990s to 90 mg/litre in early 2000) it is still questionable whether in 2009 the level will satisfy the EU-norm, as was agreed.

### **2.3 Policy implementation: general approach**

In its application of the 2003 policy reform of the CAP (Luxembourg agreement) the Dutch government brought only existing legislation within the SMR requirements. The only new things introduced since 2003 regard the GAEC (Annex IV) requirements, which are imposed on farmers since 1 January 2005.

In December 2004 they sent a first information bulletin to farmers, informing them about the changed policy regime (Dienst Regelingen, 2004). It described the meaning and implications of the SMRs. Farmers were informed about which measures will be relevant, including the starting dates (could be January 2005, January 2006 and/or January 2007). The implementation of the 19 cross compliance directives was announced to proceed as follows:

- 1 January 2005: ‘environment’, ‘public and animal health; identification and registration of animals’;
- 1 January 2006: ‘public, animal and plant health’, ‘notification of diseases’;
- 1 January 2007: ‘animal welfare’;

Moreover farmers were informed about the inspection regime and the consequences of non-compliance with respect to payment reductions. In case a farmer is negligent with respect to one or more SMRs his direct payment will be reduced, and could, in case of extreme requirement violations, be set to zero. If a farmer is negligent with respect to an SMR a standard reduction rate of 3% to his payments will be applied. When he repeatedly violates the SMRs this reduction rate is multiplied by a factor 3. If a farmer deliberately violates the SMR requirements a standard reduction rate of 20% will be applied. Six areas or spheres of requirements are distinguished, notably environment, public health, animal health and plant health, notification of animal diseases, animal welfare, and good agricultural and environmental conditions. If there are several violations within one of the distinguished spheres, this will be considered as one violation. If there are notified violations with respect to several spheres they are considered as separate violations and the reduction rates are added up. However, the total reduction rate will be not higher than 5%. A similar principle is applied with respect to repeated violations. The maximum in that case is a 15% reduction of the

payments. However, if this maximum percentage of 15% has been reached, additional violations will be considered as intended violations and be penalized accordingly.

The authority responsible for the implementation and administration of the policy, the Dienst Regelingen agency has some room for discretion. In case of a single negligence the agency can reduce the standard rate of a 3 percent reduction to 1% or increase it to 5% depending on the judgement of the inspection agency. In case of intended negligence it can reduce the reduction rate to 15% (rather than 20%) or increase it to 100%, again depending on the blameworthiness of the farmer.

The SMRs are implemented in national law. So changes in national law, automatically lead to changes in the SMRs as they are nationally implemented. The Dienst Regelingen informed farmers that this dynamic element will be particularly relevant for the GAEC-requirements. These requirements will be annually evaluated by the Minister of Agriculture, and adjusted if felt necessary. To cope with the potential dynamic adjustments farmers will be annually informed about the cross compliance requirements they have to satisfy.

After the initial bulletin, later on other bulletins followed, among which two additional ones on the CAP (Dienst Regelingen, 2005a and 2005b). Moreover a number of information bulletins were sent to farmers to inform them about the changes in the Dutch manure policy (Dienst regelingen, 2005, and 2006). In addition to the written material, the Dutch government held a number of meetings to inform farmers about the changes in the policy (cross compliance and farm payments).

The old Dutch manure policy was judged by both the Commission and the European Court to be not in accordance with the Nitrate Directive. As a consequence in January 2006 a renewed manure policy was put in place. Central element in this new policy is a system of use-norms, which indicate how much nitrate and phosphorous fertilizers from animal and chemical origin might be annually applied. Farmers have to satisfy these use norms, and if not they are violating law and subject to legal sanctions. Therewith the new system differs from the old system (known under the acronym of MINAS), which was based on loss-norms rather than use norms and in principle allowed farmers to have a surplus and pay the corresponding levy. For many farmers the new system implies a significant change and more tight constraints (see next section for further details).

As regards the implementation of EU law into national legislation, the Netherlands currently satisfies all the requirements mentioned in Annex III of EU 1782/2003. Everything is implemented in Dutch law and can be translated into requirements that have to be satisfied by farmers (full macro-compliance).

As was already noted in the previous sections the product mix of Dutch agriculture is dominated by horticulture, which is closely followed by the animal products group. The arable sector (in particular cereals production) is of relatively minor importance. In general the degree of dependence of Dutch agriculture on policy support is relatively low, which is mainly due to the prominence of the support-extensive horticulture and intensive livestock productions. In itself this implies that in the Netherlands there are a significant number of agricultural activities and enterprises which are not or only lightly depending on direct payments. As such the side conditions imposed by the cross compliance regulations on these payments will not affect this group.

## 3 Environment

### 3.1 Statutory Management Requirements

#### 3.1.1 Birds and Habitat Directive<sup>1</sup>

The aim of the Bird Directive 79/409/EEG is to protect listed bird species. More than 200 endangered birds are protected in a sustainable way. The Netherlands is responsible to undertake protective measures for 44 out of these 200 species. Moreover it is asked to protect 52 habitat types. 'Protection' implies the preservation of restoration of a sufficient amount of habitats, which have sufficient variation. This also implies the designation of special protection areas, in which special protective actions are taken in order to guarantee the protected species to have a safe living area and the possibility to regenerate. The EU member states designated already more than 3600 protected sites, comprising a surface of about 280.00 square kilometres (similar to the surface of the UK)

The Habitat Directive required the EU Member States to transpose its provisions into national law and to transmit the national list of proposed sites. In the Netherlands the implementation of the Birds and habitat directive into national law was realized by the Flora- en Faunawet (FFW) and the Nature Conservation Act or Natuurbeschermingswet (NBW). February 23 2005 the FFW was changed and a new article was included (Article 75) which created a provision for the species protection part of the Birds and Habitat Directive. In the same year the NBW originating from 1998 was adjusted to include the site protection part of the Birds and Habitat Directive.

In the Netherlands a nature area can be designated as being subject to protection in three different ways: (1) as part of the National Ecological Network (*Ecologische Hoofdstructuur, EHS*), (2) as a Special Area of Conservation under the Habitats or Birds Directive or (3) as a (protected) nature reserve (*beschermde natuurmonument*) under the Nature Conservancy Act (*Natuurbeschermingswet*). In practice, these designations overlap; some 40% of the terrestrial EHS, for example, also enjoys protection on the basis of the Habitats Directive. The three types of protection system differ both in how they designate areas for protection, in their legal effects, and in the actual protection they afford against the effects of human activity (See Table 5). Nature areas are subject to three types of protection; these differ in the manner in which the areas concerned are designated and in the extent to which they are protected against the effects of human activity.

---

<sup>1</sup> This paragraph is mainly based on the documentation as provided by the Ministry of Agriculture, Nature and Food Quality in their Newsletters Natura 2000 (see website URL [http://www9.minlnv.nl/servlet/page?\\_pageid=348&\\_dad=portal30&\\_schema=PORTAL30](http://www9.minlnv.nl/servlet/page?_pageid=348&_dad=portal30&_schema=PORTAL30)).

**Table 5** Protection of nature areas in the Netherlands

<b>Protection of nature areas</b>			
	EHS	Natura 2000	Nature-monument
<b>Designation and legal consequences</b>			
Protection	Indirectly under the Spatial Planning Act through its effects on planning	Directly by law, currently by means of the EU directives, in future by means of the amended Nature Conservancy Act	Directly under the Nature Conservancy Act
Designation instrument and legal consequences	Key Planning Decision Green Space Structure Plan 1995	Habitats Directive 1992 and Birds Directive 1979 <sup>1</sup>	Nature Conservancy Act 1968
Designating authority	Provinces, municipalities	Central government	Central government
Legal consequences via:	Spatial Planning Act	European convention	Constitution
Authority re legal consequences	Provinces, municipalities	Central government	Central government

Source: <http://www.mnp.nl/mnc/i-en-1312-print.html>

Ultimately, the national ecological network EHS is intended to be a continuous network of high-quality nature areas; these are designated by the provinces, within the framework of government targets. The areas making up the EHS are protected on the basis of the Key Planning Decision (*Planologische Kernbeslissing, PKB*) for the Green Space Structure Plan (*Structuurschema Groene Ruimte*) (SGR) and its implications for provincial regional plans and municipal zoning plans.

Designation of areas covered by the Birds and Habitats Directives is intended to create a European network of nature areas within the EU (Natura 2000). These directives aim to safeguard biological diversity within the territory of the EU. The areas concerned are designated by the member states (i.e. by their governments) according to EU criteria. Natura 2000 areas are subject to legal protection at EU level.

The objective of designating protected nature reserves (*Natuurmonumenten*) is to safeguard areas of scientific or scenic interest against human activity. Such areas are designated by the Dutch government and are then protected under the Nature Conservancy Act.

Already in 2000 the Dutch Ministry of Agriculture, Nature and Food Quality completed the designation of 79 Natura 2000 sites (about 10.000km<sup>2</sup>) under the Birds Directive. In May 20 2003 141 Natura 2000 sites were reported under the Habitat Directive. More recently, the a number of 161 sites is mentioned (LNV, 2005). The Dutch government has time until 2008 before definitive designation of the Natura 2000 areas. Criteria for selecting the habitat sites were the 51 habitat types and 35 plant species on the Dutch reference list. Similarly, the criteria for selecting the bird sites are based on the presence of the 44 summer birds and/or the 66 migratory (water) birds as notified in the Dutch reference list. Table 6 provides an overview of

the estimated state of preservation in these sites, based on a stock-taking done by the Natuur en Milieu Planbureau (2005).

**Table 6** Estimated state of preservation of Natura 2000 sites

Current state classification	Habitat-types	Plant species	Summer birds	Migratory birds
favourable	20%	5 (15%)	16 (35%)	40 (63%)
Moderately unfavourable	50%	13 (40%)	7 (15%)	14 (22%)
Strongly unfavourable	30%	14 (45%)	24 (50%)	8 (13%)

Source: Natuurbalans 2005, p.55

The Natura 2000 sites are partly overlapping with other nature protection areas. About 45% of the Natura 200 sites, for example, is subject to nature subsidisation programs. However, although this is the case, the current requirements for bird and wildlife preservation in these programs are estimated not to be sufficient to achieve the targets aimed at in the EU Directives. The main reason for this is that the criteria of these programs cover only 50% of the target species as defined in the Birds and Habitat Directives. There is still room for an additional 15% of the Natura 2000 sites which is open for nature conservation contracts. About 40% of the selected habitat sites and 30% of the bird sites are in hands of owners (Staatbosbeheer, Drinking water agencies, Ministry of Defense) who are not eligible for subsidization programs (Natuurbalans, 2005, 57-59). Moreover, a few exceptions aside, nearly all Natura 200 sites are part of the ecological network structure EHS. This was intentionally done so and implies that in a lot of cases alongside the Natura 2000 targets also have EHS nature targets.

Within three years after designation of a site as a Natura 2000 site there has to be a management plan. But preceding this preservation targets have to be specified at species and habitat level. The preservation targets are defined at both national and site level. At national level the preservation targets follow directly from the EU requirements, whereas the site specific targets define the contribution of each site to the national targets. Many sites of community importance under the FFW and NBW legislation are already part of nature or landscape conservation areas, or water protection areas. This can lead to constraints to farmers depending on the management measures taken. In total management plans for about 160 areas have to be formulated.

It is the constraints in the management plans which will determine the restrictiveness and costs of the Birds and Habitat Directive for Dutch farmers. At this moment the exact requirements are not yet available or known. The challenge is to formulate realistic and feasible management constraints, which are on one hand workable for the farmers and on the other hand sufficient in meeting the final targets of the Birds and Habitat Directive.

The favourable conservation status of species and habitats under the directive may be achieved by different instruments. Authorities have to issue ordinances that lay down the conservation objectives for a certain protection area and define activities that are required, not permitted or need a special authorisation. However, depending on the special circumstances, other instruments may be adopted such as contractual and voluntary agreements, protection programmes and others. In fact for a number of the Natura 2000 sites already significant areas are brought under such contracts.

In the Netherlands the Articles 8 to and including 15, and 31, 37, 46, 50, 53 and 72 are brought under the SMRs of the Birds and Habitat Directive. Their main implications are listed below. Within brackets the associated relevant article of the EU Directive is given:

- Art.8: Forbids to catch, destroy, possess, sell, etc. protected indigenous plants (Art.3);
- Art.9: Forbids to kill, disturb, possess, sell, etc. protected indigenous birds (Art.4, sub 1, 2 and 4);
- Art.10: Forbids intended disturbance of indigenous birds (Art.5);
- Art.11: Forbids the disturbance or to destroy nests of protected indigenous birds (Art.7);
- Art.12: Forbids the gathering and possession of eggs of protected indigenous bird species (Art.8);
- Art.13: Forbids to possess or trade (products of) protected indigenous or exotic or foreign birds (Art.8);
- Art.14: Forbids to spread out birds or eggs in the free nature (Art.8);
- Art.15: Forbids people to possess or trade not-allowed hunting materials (Art.8);
- Art.31: Forbids killing, disturbing, possessing, selling, etc. of protected indigenous birds (Art.8);
- Art.37: Requires hunters to follow responsible hunting practices (Art.8);
- Art.46: Forbids hunting with not-allowed means, on not allowed days and times and on not allowed places. This article contains an explicit reference to the protected sites under EU Directive 79/409/EEG as places where no hunting is allowed (Art.8);
- Art.50: Forbids to be in the fields in order to hunt with not-allowed means and forbids the killing of protected birds (Art.8);
- Art.53: Forbids to hunt with not-allowed means, on not allowed days and times and on not allowed places (Art.8);

- Art.72: Forbids hunting which conflicts with the license conditions or with not allowed (animal unfriendly) hunting equipments (Art.8).

Large portions of the submitted areas for Natura 2000 are under agricultural cultivation and in nearly all cases the agricultural use will be kept even after the official designation. For several habitat types and species the agricultural use of land can be considered a precondition for its conservation value. But in some cases farmers will face particular constraints and have to face particular restrictions to achieve the favourable conservation status of the sites. It are these constraints, rather than a lot of the above mentioned requirements, which will determine the impact on farmers as well as the additional costs faced by them.

The constraints faced by farmers differ largely since the regulations for each individual protection area vary according to the conservation objectives, the species and habitats concerned and the degree to which they are threatened. Protection ordinances may for instance prohibit or restrict the use of fertiliser and pesticides, the ploughing up of grassland, grazing, or set limits for livestock densities. As stipulated by the Birds Directive, the removal of landscape features is forbidden. Moreover since (nearly) all Natura 2000 sites are subject to the (revised) Nature Protection law, a licence is needed for any action which might lead to a deterioration of the habitat quality of the sites. The exact requirements are described (specified at a detailed level for specific areas) in LNV (2005a). An uncertainty with respect to the requirements is coming from the Water Directive. The impact of this Directive on Natura 2000 is not yet fully known since these norms will be specified not earlier than in 2008/09. However, it seems rather clear that taking into account the Water Directive will require more strict manure application constraints. This is likely to increase the yield reduction and thus increase costs. No clear date could be found when all preservation goals need to be achieved.

Farmers may be compensated for financial losses due to restrictions of agricultural land use in Natura 2000 areas.

### 3.1.2 Protection of groundwater

The Groundwater Directive was implemented in the Netherlands in 19?? **Lozingenbesluit Bodembescherming LBB**. Article 25 of this legislation is included in the SMRs. It prohibits or restricts direct and indirect discharges of certain hazardous substances into the groundwater. Of those, mineral oil products and chemical plant protection products are the main substances relevant for farmers. Farmers have to ensure that these substances are not diverted into groundwater and that facilities for storage of pesticides and oil products and farm petrol stations are constructed and operated accordingly. Storage facilities have to be leak-proof and stable, to be based on solid and impermeable ground and to be resistant to mechanical, thermal and chemical influences. Facilities may have to be equipped with catchment areas. Article 25 does not apply to the discharge of household waste water.

If agricultural waste water contains organic manure and is uniformly spread on the soil the LBB law does not apply, but the material is subject to the manure legislation (*Besluit gebruik meststoffen*). This effectively also holds for waste water arising from cleaning of milking parlours, etc, which is allowed to be discharged into the manure storage.

### 3.1.3 Sewage sludge directive

The Sewage sludge directive (86/278/EEG) is transformed in national legislation with the *Besluit kwaliteit en gebruik overige organische meststoffen*. This law not only regards sewage sludge, but also restricts the use of compost and black soil, or any mixtures of these. Only sewage sludge from household or communal waste waters may be used in agriculture.

Firms which produce, handle or process sewage sludge (or black soil) have to register the amounts handled, the names of the people to which the material is delivered, in what quantities and with details about the composition of the sewage sludge. These details include dry matter content, Nitrate and phosphorous levels, pH-value, content levels of heavy metals. These content-levels should be lower than pre-specified norms

The application of sewage sludge has to be adjusted to the nutritional requirements of the plants, taking into account the nutrients and organic substance present in the soil as well as further site and growing conditions. Also, plant nutrients contained in the sewage sludge have to be documented.

Prior to the application of sewage sludge, the soil needs to be analysed with respect to pH-value and its content of several heavy metals, plant-available phosphate, potassium and magnesium. The costs for these measurements are borne by the supplier of the sewage sludge. The application of sewage sludge is permitted if the pH-value or the concentrations of the pollutants exceed certain limit values.

The quantity of applied liquid sewage sludge may not exceed 2 tonnes of dry matter per hectare of arable land within two years, or 1 ton dry matter per hectare of grassland in two years. Corresponding application levels for solid sewage sludge are 4 tons dry matter per hectare of arable land per 4 years, or 2 tons dry matter per hectare of grassland in two years. If sewage sludge is applied there are also limitations with respect to land use or land use changes.

More precisely the following requirements of the *Besluit kwaliteit en gebruik overige organische meststoffen* are part of the SMR requirements:

- Art.13: The use of sewage sludge on agricultural land is forbidden unless it appears after sampling and analysis that the pre-specified norms are satisfied;
- Art.18: Biannual application of liquid sewage sludge should be less than 2 ton dry matter/ha of arable land and less than 1 ton dry matter of grassland;
- Art.19: Solid sewage application should be no more than 4 ton dry matter/ha on arable land or 2 ton dry matter/hectare of grassland in a four year period;
- Art.23: Sewage sludge should not be applied on other land than land used for agriculture or nature;
- Art.28: Forbids application of sewage sludge on partly frozen and/or snow covered soils;
- Art.28a: Forbid application of sewage sludge on grassland when it is used for grazing;
- Art.28b: Forbids application of sewage sludge on soils of which the top layer is saturated with water;

- Art.28c: Forbids the application of sewage sludge in the period September 1 till January 31 when the soils are infiltrated, irrigated or sprinkled;
- Art.29: Forbids the application of sewage sludge on arable land and grassland in the period September 1 till January 31. Arable land consisting of clay or peat soils is exempted. During the period September 1 till September 15 grasslands on clay and peat soils are exempted from the application constraint;
- Art.30: Sewage sludge has to be applied in a low-emission way;
- Art.34: Requires even spreading of sewage sludge and forbids the application sewage sludge on sloping (>7%) and erosion-sensitive soils, in particular when used for arable crops.

### 3.1.4 Nitrate directive

Because of the deficits of the old (pré 2006) manure policy the European Commission initiated an infringement procedure against the Netherlands. In October 2003 the European Court judged that the Dutch system was not satisfactory. As a consequence the Netherlands had to amend its policy in order to address the noted deficits. As mentioned before (see Section 2.3) these amendments necessary to satisfy the Nitrate Directive implied a significant change in the Dutch manure policy in making it more restrictive.

Since January 1 2006 a renewed manure policy has been put in place, which is stricter than the old manure policy. Whereas the old manure policy (known under the acronym MINAS) focused on so-called loss norms and allowed farmers to have a surplus and paying a corresponding levy, under the new system this is no longer the case. The new system focuses on use norms rather than surplus, and does not allow transgression of the application norms. The provisions of the Nitrate Directive are implemented in the Netherlands by means of 8 different laws. See Table 6 for a detailed overview.

**Table 6** Transformation of EU Nitrate Directive into Dutch national law

<b>Nitrate Directive</b>	<b>Dutch law</b>	<b>Article(s)</b>	<b>Implementation in Dutch law: provisions relevant for CC</b>
<i>Annex II A: codes of good agricultural practice should contain provisions on:</i>			
Periods when land application of fertiliser is inappropriate	Besluit gebruik meststoffen	4, 4a, 4b	Organic manure may not be applied from September 1 till January 31; chemical fertilizers may not be applies from September 16 till January 31; Grassland may not be ploughed from September 16 till January 31; Arable land exclusively used for fruit

<b>Nitrate Directive</b>	<b>Dutch law</b>	<b>Article(s)</b>	<b>Implementation in Dutch law: provisions relevant for CC</b>
			production is exempted.
Application of fertiliser to steeply sloping ground	Besluit gebruik meststoffen	6a, 6b, 6c, 6d	No organic manure should be applied to steeply sloping soils (>7%) which are sensitive to erosion (gullies of 30cm or more), or which is laid fallow; No chemical fertilizers might be applied on fallow soils with a slope of 7% or more; Neither organic manure or chemical fertilizers are allowed on soils with a slope of 18% or more.
Land application of fertiliser to water-saturated, flooded, frozen or snow-covered ground	Besluit gebruik meststoffen	3, 3a, 3b	Fertilisers may only be applied if the soil is able to absorb it, i.e. the application is not permitted on soil that is flooded, water saturated, snow covered or frozen.
Land application of fertiliser near water courses	Lozingen-besluit open teelt en veehouderij	16, juncto 13	Direct discharge of fertilisers into surface waters has to be prevented. Adjacent to surface water a crop-free zone varying from 50cm till 500cm, depending on crop/fruit type, used application machinery, availability of catch crop
Capacity and construction of storage vessels for livestock manures (capacity must exceed that required for storage throughout the longest period during which land application is prohibited)	Uitvoerings-besluit meststoffen-wet	27, juncto 28, 29, 30, 36	Facilities for storage and filling of slurry, manure and silage effluent have to be stable and leak-proof, and constructed in a way that prevents the discharge into groundwater, surface waters or the sewer system. Until then, the capacity of storage containers has to be at least such that the periods where application of fertiliser is not permitted can be bridged.
Procedures for the land application of both chemical fertiliser and livestock manure	Besluit gebruik meststoffen	2, 5, 6	Organic manure may not be applied on nature areas or non-agricultural areas; Organic manure has to be applied in a low-emission way (e.g. it has to be injected or worked into the soil immediately); Organic manure has to be evenly spread over the land
<i>Annex III</i>			
Limitation of application of fertilisers to be based on a balance between nitrogen	Besluit kwaliteit en gebruik		A detailed system of manure use norms has been defined for organic manure (defined in N equivalents), N and P in

Nitrate Directive	Dutch law	Article(s)	Implementation in Dutch law: provisions relevant for CC
requirements of the crops and nitrogen supply to the crops	overige organische meststoffen  Uitvoerings-regeling Meststoffen-wet		kg per hectare. Norms differ according to soil type and soil use.  Farmers have to keep documentation of the nutrient amounts in the soil and in the fertilisers, and of all application activities. A nutrient balance has to be annually provided.  Farmers applying for derogation (share of grassland in total land is at least 70%) are allowed to apply 250 kg N/ha (rather than 170kg N/ha). They should supply a manure management plan for their farm before February 1 of the year for which derogation is asked
Limited amount of manure per hectare	Meststoffen-wet	55,	At farm average, no more than 125kg P per hectare is allowed  170 kg N per hectare from fertiliser of animal origin may be applied. For grassland for which derogation is granted an upper limit of 250 kg N per hectare is allowed.

The manure and fertilizer application regulations apply uniformly across the national territory, which makes the definition of vulnerable zones obsolete (Art. 3 (5) Nitrate Directive). It thus simultaneously implements the measures called for in Article 4/Annex II and in Article 5/Annex III of the Nitrate Directive (see Table 6).

The Dutch legislator successfully tried to make the upper limit of 170 kg N/ha more flexible, using the flexibility options of Annex III 2.(b) of the Directive. June 27 2005 the Nitrate Committee honoured the Dutch derogation-request. Derogation was granted for a period of 4 years (2005-2009). Would the Netherlands like to have an extension of derogation for a next period (2010-2013) than a new request will have to be made. The derogation facility allows farmers, which have more than 70% of their total land in use as grassland, to apply 250 kg N originating only from manure of grazing animals per hectare (rather than 170kg). This holds for all soil types. Land is considered as grassland if in the year a farmer applies for derogation he uses a piece of land during the period of May 15 till September 15 of that year as grassland (grass destined for animal feeding; not catch crop use nor seed production allowed). A farmer has to make an annual request for application of the derogation facility.

Moreover, before February 1 of the year a farmer wants to apply for derogation (s)he has to have a manure application plan, which covers all the parcels of land the farmer uses. This plan has not to be submitted, but should be available in the farm administration and be kept for a period of 5 years. Changes made (for example because of a change in the crop rotation) have to lead to an update of the manure application plan within 7 days.

In addition farmers applying for derogation are required to sample their land with respect to Phosphorous and Nitrate rates at least one time per 4 years.

Finally, farmers applying for derogation face some further limitations with respect to the application of manure on arable land (no application from September 16 till January 31) and are obliged to cooperate with respect to periodical researches with respect to the groundwater quality and farming practices done by the government agencies during the derogation-period.

## **4 Identification and registration of animals**

### **4.1 Identification and registration of bovine animals**

The EU Directives on Identification and Registration of animals (92/102/EEG, and Regulations 911/2004, 1760/2000, and 21/2004) are transformed in Dutch national law by the *Regeling Identificatie en Registratie van Dieren* (RIRD) the *Gezondheids- en Welzijnswet voor Dieren* (GWD) and the *Regeling handel levende dieren en levende producten* (HLDLP). The EC regulations are directly applicable in the Member States but in some places have to be concretised by national legislation. Regarding the identification of bovines the farmers have to make the following provisions that are relevant for CC (National law articles are added in brackets):

- Farmers have to register themselves as a farmer keeping animals (RIRD: Art2).
- Livestock owners have to identify each animal born after December 31 1997 by official double eartags. It is not allowed to remove, destroy eartags or to make them unclear. In the case of loss, eartags have to be replaced. Calves have to be identified within 3 days after birth; animals that are imported from non-EU countries within 3 days after arrival at the farm. Here the Dutch law is more stringent than regulation 1760/2000 which only stipulates that identification has to take place within a period of no longer than 20 days (RIRD: art.4, 8, 10, 11, 12, 15; GWD: art.104).
- Animal holders have to keep a register that contains the information required by the relevant EC Regulations and Directives (eartag number, birth date, sex, breed and eartag number of the dam, and name and address of suppliers or buyers of animals, and dates). The format of the register is specified by the Dutch ordinance: if it is kept in manual form, it has to be bound, chronological and pages have to be numbered. If it is kept in computerised form, a printout has to be

provided by the farmers in the case of controls. Registers have to be kept at least for three years (RIRD: art 15, 19).

- Farmers have to notify all changes (birth, buy, sell, death, slaughter, import, export) in their cattle livestock within 3 working days to the. Notification is done by telephone with a voice response system or electronically (RIRD: art.20).
- As required by Article 6 of the Regulation, whenever an animal is moved within the national territory between two separate holdings, it has to be accompanied by a movement document. This document has to contain the information prescribed by Annex C of the Regulation, no further data requirements being added. It has to be kept for at least three years (RIRD: art.30).
- For each individual animal a cattle passport (gezondheidscertificaat/health certificate) has to be kept. In order to apply for the passport, the cattle holder has to inform the authority of the animal's birth date, sex, breed, eartag number of the dam, and his name and address as well as the registration number of the farm. The cattle passport has to be handed back to the authorities if the animal is slaughtered on the farm, or given to the slaughterhouse operator. It also has to accompany the animals in the case of transports (HLDLP: art.3.2).

## **4.2 Identification and registration of ovine and caprine animals**

The identification and registration of ovine and caprine animals, as prescribed by EC Regulation 21/2004 is translated in Dutch national law as follows (National law articles are added in brackets):

- All holders of ovine and caprine animals have to keep a register as required by Article 5 of Regulation 21/2004. The register has to contain the information required by Annex A of the Regulation; no further data requirements are added and thus no use is made of Article 5 (2). However, the format of the register is specified similar to that of bovine animals. Registers have to be kept at least for three years (RIRD: art 2).
- All ovine and caprine animals born after 9 July 2005 have to be identified by a double eartag. The first non-reusable eartag has to be imposed at least within one month after birth, but in any case before they leave the holding. A second identification eartag has to be imposed no later than 6 month, but in any case before they leave the holding. The Netherlands is more strict than EU law, which generally allows the period of registration to be six months. Lost eartags have to be replaced immediately (RIRD: art.34, 15).
- For ovine and caprine animals born on or before 9 July 2005 the regulations prescribed by the Livestock Movement Regulation apply. These animals have to be identified by at least one official eartag (or tattoo) within one months after birth and in any case before leaving the holding. Lost eartags have to be replaced as soon as possible (RIRD: art.34, 15).
- As required by Article 6 of the Regulation, whenever an animal is moved within the national territory between two separate holdings, it has to be accompanied by a movement document. This document has to contain the information prescribed

by Annex C of the Regulation, no further data requirements being added. It has to be kept for at least three years (RIRD: art.30, 36).

- Farmers have to notify all changes (birth, buy, sell, death, slaughter, import, export) in their cattle livestock within 3 working days to the. Notification is done by telephone with a voice response system or electronically (RIRD: art.36).

## 5 Public, animal and plant health

### 5.1 Plant protection products

The Directive on the placing of plant protection products on the market (91/414/EEC) was implemented by way of the *Bestrijdingsmiddelen Wet* (BW). Provisions from several national ordinances are also relevant for cross compliance, among which *Regeling verwijdering dompelvloistof* (RWD), *Besluit beginselen geïntegreerde gewasbescherming* (BBGG), *Besluit luchtvaarttoepassingen bestrijdingsmiddelen* (BLB), *Besluit regulering grondontsmettingsmiddelen* (BRO), and the *Lozingenbesluit open teelt en veehouderij* (LOTV). The following points list the transformation of the EU Directive into Dutch national law (National law articles are added in brackets):

- Only plant protection products that have been authorised may be used (BW: art.2)
- Plant protection products may only be used for the purposes for which it is allowed and not in any other way. (BW: art.10).
- It is not allowed to remove immersion-liquids used with bulbs. (RWD: art.2).
- A farmer is obliged to have a plant protection plan in which he clarifies for each crop how he applies the principles of the good plant protection practice (regards pre-treatments, applications, and harvested products) and makes clear that legal requirements are satisfied (BBGG: art 2).
- Together with the plant protection plan the farmer has to keep record of all relevant actions (plant protection logbook). If deviations from the plan are made they have to be registered within 72 hours after the deviation took place. Deviations need to be described, motivated, and provide the date of the change (BBGG: art 2).
- Special requirements have to be fulfilled in case of application of plant protection products out of the air. Among these are: putting of warning signs when treatment is applied, taking care that no people are on the fields of application, no application allowed under windy circumstances, from a too great height, on too small parcels. All treatments of plant protection products with use of airplanes have to be registered (applied products, day of treatment, etc). The farmer who would like to make use of this possibility needs a permit from the city office. (BLB: art. 2, 3, 4, 5, 6).
- Farmers are not allowed to have or use ground treatment plant protection products without a permit which regulates the use of these means. (BRO: art.2, 3).

- It is not allowed to apply plant protection products close to surface water, without having a crop-free zone. These zones vary from 25cm till 500cm, depending on the crop, plant protection spreading equipment used, and the availability of catch crops. (LOTV: art.13).

The EU legislation prescribes that certain criteria have to be followed in order to decide in allowance of a certain plant protection product. Different countries still apply different criteria. Not adopting each others criteria may create differences in the competitive level playing field. Moreover, when facing a certain amount costs associated with completing an allowance procedure, for a chemical industry it is more attractive to do this for a large country or market rather than a small one. In some small market cases those firms might even abstain from asking allowance, which yields different availability of plant protection means over countries.

## 5.2 Food traceability systems/matters of food safety

The provisions from the EC regulation 178/2002 relevant for CC (Articles 14, 15, 17-20) are transformed in Dutch national law by means of the Kaderwet diervoeders (KWDV), the Regeling diervoeders (RDV) and the Warenwetbesluit bereiding en behandeling van levensmiddelen (WWLM). The following requirements specified in these laws are brought under the checked cross compliance conditions (National law articles are added in brackets):

- It is forbidden to have, process, etc. any animal feeds, feed supplements, pre-mixes that are not healthy, pure, and of good quality. (KWDV: Art.2, 4)
- Animal feeds are required to be safe, which implies them to be not harmful for animals, for human health, or for the environment. (RDV: Art.74).
- All products that are intended for food or feed use have to be safe and traceable in all stages of the production process, processing and distribution (WWLM: art.2 sub 10).

The traceability of food and of feed has to be ensured. For the Netherlands with a feeding practice which heavily relies on the use of compound feeds derived from the compound feed industry, this in particular affects this sector and less so farmers. Farmers involved in home mixing will be required to follow the general rules for feed production. While in animal production consistent documentation is ensured by livestock registers, the new standards concerning the provisions on documentation and on hygiene in processing, storage and transport might pose a challenge particularly for those farmers who are involved in on-farm food production (e.g. on farm preparation of dairy products) or make use of on-farm storage.

## 5.3 Hormones and beta-antagonists

EU Directive 96/22/EC regards the prohibition of substances having a hormonal or thyrostatic action and of  $\beta$ -agonists. Several Dutch national laws cover this requirement, notably the *Diergeneesmiddelenwet* (DGW), the *Besluit verboden*

*stoffen Diergeneesmiddelenwet (BVSD), the Regeling verbod handel met bepaalde stoffen behandelde dieren en producten (RVH), and the Regulation of the Product Board of Animals and Meat. Below the requirements brought under the inspected cross compliance conditions are listed (National law articles are added in brackets):*

- It is prohibited to prepare, have, or use any veterinary medicinal products which are not authorised (DGW: art. 2 sub 1).
- It is prohibited to apply certain medicines, as specified by the Minister of Agriculture, to animals (BVSD: art.3 sub 1).
- It is prohibited to exchange animals or animal products to which in any way substances having a thyreostatic, estrogenic, androgenic and gestagenic effect, of stilbenes and  $\beta$ -agonists are applied (RVH: art. 2, sub 1a and 1c; 3 sub c).
- Only those animals, animal products, and meat products might be exchanged which are or have been properly treated in accordance with the DGW-law. (RVH: art. 3, sub 2). The veterinarian has to document the treatment in a register.
- For breeding animals, medicinal products with hormonal action may be used to synchronise oestrus and to prepare animals for the transfer of embryos. Application should be in accordance with the DGW-law and is only allowed by a veterinarian. The veterinarian has to document the treatment in a register (should contain information on kind of treatment, product used, date of treatment, identity of animal to which medicine is applied).

The (more specific) requirements following from the Regulation of the Product Board of Animals and Meat were not yet available at his moment.

## **5.4 Notification of diseases**

According to the Directives on notification of diseases (Directives 2003/85/EC, 92/119/EEC and 2000/75/EC; Regulation 999/2001) the suspected or confirmed presence of several animal diseases, e.g. foot-and-mouth disease, swine vesicular disease, and bluetongue, has to be notified immediately to the competent authority. Two Dutch national laws, notably the *Gezondheids- en welzijnswet voor dieren* (GWD) and the *Regeling Diervoeders* (RDV) make provisions which are brought under the inspected cross compliance obligations. More precisely the following requirements hold (National law articles are added in brackets):

- If foot and mouth disease (FMD) is suspected in one of his bovine animals the farmer has to immediately notify this to the authorities. (GWD: art.19 sub 1).
- If classical swine fever (SWF) is suspected in his pigs, the farmer has to immediately notify this to the authorities. (GWD: art.19 sub 1).
- If BSE is suspected in a bovine, ovine or caprine animal, the farmer has to immediately notify this to the authorities. If foot and mouth disease (FMD) is suspected in a bovine animal at a holding the farmer has to immediately notify this to the authorities. (GWD: art.19 sub 1).

- It is prohibited to feed feeds with proteins originating from animals to bovine, ovine or caprine animal. (RDV: art.68).
- If Bluetongue is suspected in his sheeps, the farmer has to immediately notify this to the authorities. (GWD: art.19 sub 1).

## 6 Animal welfare

During the last 15 years the Dutch government has worked top improve animal welfare by implementing the Animal Health and Welfare Acts (GWWD). This law has definitely contributed to a number of improvements in animal welfare. At the same time it generated discussions about regulations which bogged down by details and the wish to develop all-encompassing legislation. It became more and more clear that welfare regulations should address the chain rather than individual links. Some changes have been made, notably the change from individual housing to group housing in different sectors. Not all issues have been solved.

Animal welfare is considered by the Dutch authorities to start with good health. But physical health is just one aspect of animal welfare. A guideline in the Dutch thinking on animal welfare is the so-called five freedoms according to which animals should be free<sup>2</sup>:

- from thirst, hunger and malnutrition;
- from discomfort by providing an environment suitable to their species;
- from pain, injury and disease;
- from fear and distress;
- to express natural behaviour.

As the second and third freedoms make clear this affects the housing system of animals. In the next subsections it are is particular the housing requirements for calves and pigs that is be paid most attention to.

### 6.1 Housing of calves

Since the provisions on the housing of calves become relevant for cross compliance only in 2007, they are not yet included in the checklists and brochures provided to farmers by the agricultural authorities. In the Kalverbesluit directive of the Dutch government it is specified that from January 1 and onward calves may no longer be individually housed, but require group housing. Each calve should have a space of at least 1.8 square meters. Additional requirements are specified with respect to the availability of daylight, ventilation, etc. There are three instances which can monitor on housing (the governmental inspection agency AID, the Rijksdienst voor Keuring

---

<sup>2</sup> Originally these five animal freedoms were specified by the Brambell Commission in 1965. They were more recently taken over by the Commissie Wijffels, a Duth advisory committee to the Minister of Agriculture, Nature, and Food Safety.

van Vee en Vlees, and Association for Quality Control in the Calve Sector in case farmers are participating in a semi-voluntary IKB certification scheme).

## 6.2 Housing of pigs

Within the breeding pig sector group housing (57%) and vloerligboxen (42%) are the dominant farming practices (De Vlieger et al, 2005, 54).

The legal situation concerning the keeping of pigs is included in the Dutch regulation *Varkensbesluit* which defines requirements with respect to housing and treatment of pigs. The required space standards are provided in Table 7

**Table 7** Housing space requirements for pigs ( in m<sup>2</sup> per animal)

Average weight of pig	Space standard per pig, for stables built before November 1 1998 and not reconstructed or changes thereafter	Space standard per pig, for stables built before November 1 1998 and reconstructed or changes thereafter	Space standard per pig, for all stables applicable from January 1 2013 and onwards
Till 15 kg	0.20	0.20	0.20
From 15 till 30 kg	0.30	0.30	0.40
From 30 till 50 kg	0.50	0.50	0.60
From 50 till 85 kg	0.60	0.65	0.80
From 85 till 110 kg	0.70	0.80	1.00
More than 110 kg	1.00	1.00	1.30

For sows and gilts, kept in group-housing the minimal space requirement is 2.25 m<sup>2</sup>/animal. Depending on the magnitude of the group the standard has to be increased or can be reduced. For groups of less than 6 animals the space standard has to be increased with 10%. For groups with 40 animals or more the space standard may be lowered with 10%.

Alongside the space requirements the *Varkensbesluit* law contains provisions about castration of bears, day and night-rhythm, tooth-treatments, drinking water requirements, availability of ‘playing’ materials (including straw, hay, wood, compost, etc.). It is estimated that 32% of the breeding pig holders provides straw and alternative materials to their pigs (De Vlieger et al, 2005, 54).

It is not yet clear which part and to what extent these regulations will be brought under the cross compliance inspection requirements.

## 7 Good agricultural and environmental condition (GAEC)

The EU Regulation on keeping land in good agricultural and environmental condition (GAEC) is translated in Dutch national law by two regulations, notably the *Verordening HPA erosiebestrijding landbouwgronden* (EL-HPA) from 2003 and the *Verordening PT erosiebestrijding tuinbouwgronden* (EL-PT) from 2004. Both regulations have similar requirements but for different farming types (arable, horticulture). In addition to the preservation requirements there is also a measure imposed concerning the retention of permanent pasture. More precisely the following requirements are brought under the inspected GAEC conditions (National law articles are added in brackets):

- Farmers have to notify more than normal erosion and submit a plan with the measurements they take to adequately fight this erosion. (EL-HPA: art.3 and EL-PT: art.3)
- Farmers are required to apply the following soil treatment measures (EL-HPA: art.4 and EL-PT: art.4 ):
  - Targeted post-harvest soil tillage (minimal depth 20 cm) aimed at avoiding soil erosion. This treatment has to be done as soon as possible after harvest, but anyway before October 1 in case of cereals or before December 1 in case of other crops.
  - Wiping out of tractor-wheel lines after seeding of sugar beet and maize
  - Obligatory use of follow-up green manure crop after maize and cereal crops
  - Create water flow-hindering provisions at beneath-side of parcels
- It is prohibited to grow erosion enhancing crops on land with slopes of 2% or more, unless specific conditions are satisfied (If slope is between 2-5%: no erosion enhancing crop zones larger than 400m; use of mulch or straw coverage; use of direct-seeding technology. If slope is between 5-18%: no erosion enhancing crop zones larger than 300m; use of mulch or straw coverage; use of direct-seeding technology) (EL-HPA: art.5 and EL-PT: art.5).
- It is prohibited to exploit soils with a slope of 18% or more in another way than grassland. (EL-HPA: art.5 and EL-PT: art.5).
- If the farmer has an erosion-reduction plan he is required to take the measures indicated in that plan. Certain elements of articles 4 and 5 are then no longer obligatory. (EL-HPA: art.6 and EL-PT: art.6; element on soil erosion plan).

An additional instrument is employed to ensure that permanent pasture area (used as grassland for a period of 5 years or more) does not decline beyond 90% of the level that was present in 2003. For farmers this implies that:

- They have to annually report how they are using their land, in particular the amount exploited as grassland.
- Grassland reconstruction/improvement is still allowed, but ploughed grasslands have to be immediately turned back into new grasslands in order to count as grassland.
- If the ratio decreases by more than 10%, the re-conversion of land into permanent pasture has to be ensured, i.e. farmers have to re-seed land that was ploughed, or establish new permanent pasture on different areas. If relevant this will be ordered by the Minister of Agriculture.

## **8 Survey approach**

### **8.1 Introduction**

A crucial part of this research is to improve the insight in the impacts of cross compliance. Important issues are how the SMR and GAEC requirements contribute to an increase in the degree of compliance, the created benefits (target achievement), the additional costs imposed on the agricultural sector, and bottlenecks as perceived by farmers and also regarding the implementation. For several reasons it is difficult to grasp this information. To mention a few:

Firstly, cross compliance is not yet fully implemented and one cannot rely on a significant period of past experience. This hinders the detection in trend changes as a consequence of cross compliance. The degree of compliance, for example, could already been increasing in the past for all kinds of other reasons. Notifying an increase in last year in itself is not sufficient to conclude that cross compliance has been very effective. It could be only an extension of the past trend (with- and without situation should be well-distinguished). Moreover, if the past trend would be in the direction of increasing compliance and the degree of compliance is approaching 100 percent, one could imagine that the annual rate of improvement is likely to slow down since increasing compliance starting from a low base level is easier than realizing the same improvement from a stage where there is already a high level of compliance.

Secondly, the available data about compliance are to a large extent based on information of inspection agencies. However, their information, although useful, gives only a very indirect and vague picture about the degree of compliance. More precise information and cross-checking of this information would be very useful. In order to get a reliable estimate about the additional costs, for example, information about the degree of compliance as well as an estimate of the 'distance' of deviation from the norms are crucial.

Thirdly, some kinds of information can only be get when asking farmers directly. Of course there is the risk of non-response or biased response. There are a number of options to cope with these problems or to try to reduce them. For example, suspected biases in response could be detected by asking a number of alternative and 'less sensitive' questions, which can be later used to indirectly check the response to the 'sensitive' questions.

For these reasons it was decided to not only rely on secondary data, but also try to generate a primary data base. This was realized by pursuing a survey among about 1500 Dutch farmers.

The next sections describe the set-up of the survey and provides some summary statistics of the obtained results. More detailed information about the specific results is provided at other parts of this deliverable, in particular in the Sections 9, till 11 on degree of compliance, costs of compliance, and (perceived) benefits of compliance.

## 8.2 Survey

The survey was developed which was sent to about 1500 farmers in the Netherlands. This paragraph only focuses on the dairy-beef sector, because those data are processed yet. The survey was also sent to arable farmers and livestock farmers. Also with respect to the arable farmers some some indicative first results are discussed, but for the livestock sector results can not yet be presented<sup>3</sup>.

The survey was sent to about 790 dairy-beef farmers. In the survey questions were asked about:

- farm characteristics (area, types of animals kept, crop rotation, appliance for direct payments);
- which of the SMR's (2 out of 18) were considered as the most difficult to satisfy and as the most easy to satisfy;
- to which extent CC lead to changes in the farming practice and to which extent the amount of changes needed are already done (degree of compliance);
- the costs associated with satisfying the SMRs, where costs include increased labor efforts, other operational costs, investment costs, etc.;
- the GAEC conditions;
- contribution of CC requirements to an improvement of nature (incl. biodiversity, wildlife) and environment;
- opinions about a number of propositions;
- inspection.

---

<sup>3</sup> Developing a questionnaire and using this for a large postal mail survey among about 1600 farmers was no part of the initial research design. The decision to do this was taken last February at the project partner meeting in Emillio Reggae, Italy. There it was found important to try to gather primary data from farmers for at least one country in order to include on farm experiences, to create an independent data source for cross-checking with other sources of information (governments, inspection agencies, etc.), and to better understand compliance, bottlenecks, types of costs farmers have to make (e.g. labour efforts) and effectiveness of surveillance system. Questionnaires were developed and testes in several pilot sessions with farmers and sent to farmers in April.

The survey has been organized according to a stratified random sample strategy. This was done to guarantee an adequate representation of dairy farms, arable farms and intensive livestock farms. Moreover, with respect to the GAEC conditions it was assured that a sufficient number of surveys were sent to farms with sensitive (sloping) soils (Limburg-province).

A response rate of about 14.6% for the dairy-beef survey is realized (includes only valid returns; biasedness in response has been checked)<sup>4</sup>. At the moment 115 dairy-beef farm cases are processed, which form the basis of this short note of the results (see next section).

For the arable sector until now only a subset of data could be analysed (about 30 observations) and presented results will be preliminary and in need for further analysis.

### 8.3 General results

In this section general results, which are not more in detail discussed elsewhere in this report will be mentioned. Among others general opinion and attitude statements of farmers on CC and the government implementation of it (communication and accessibility of government services, etc.).

The dairy-beef farmers denoted the Nitrate Directive and Identification and Registration (I&R) Directive as the most difficult to satisfy. About 42.5% of the farmers pointed in particular to the requirement to have no more than 125 kg P per hectare as the most limiting one. For the I&R-Directive it was about 27.4% of the farmers which denoted this requirement as the most difficult one to satisfy. Non-surprisingly manure and I&R are the main themes regarding cross compliance for livestock farmers. A significant number of dairy/beef farmer-respondents in the survey, about 20%, complained about the bad accessibility of the authorities where the registration of changes should take place. Farmers indicate that it only can be done by phone. Some modernization was considered useful here.

The notification of animal diseases, sewage sludge, reporting outbreaks of animal diseases and ground water requirements are mentioned as least limiting or most easy to satisfy.

The arable farmers also denoted the Nitrate Directive as the most difficult to satisfy. About 52.4% of the farmers pointed in particular to the limitation that it is not allowed to bring manure on the land from September 1 till January 31 and fertilizer from September 16 till January 31. Regulations regarding sewage sludge, ground water requirements and the bird and habitat directive are mentioned as least limiting or most easy to satisfy.

In the survey was a question with 12 propositions about cross compliance and some of its specific regulations. Four of those propositions are highlighted here. Farmers could give a mark for each proposition from 5 (completely agree) to 1 (completely

---

<sup>4</sup> Taking into account the non-valid responses also the response rate is about 20 percent, which is not unusual for this kind of postal surveys.

disagree). On the question if the cross compliance regulations have led to a higher respect of farmers regarding environmental and animal welfare regulations, farmers tend to disagree with it (2.77). Farmers almost completely agreed when they were asked if the regulations about the I&R Directive were too strict and the sanctions too hard (4.12). Farmers also agreed (3.99) on the question if they felt the norms of urea excretion for dairy cows not sufficient based on arguments and research. Dairy farmers feel that further research is needed to get the right levels of acceptable urea excretion. The last proposition discussed here, is the proposition if farmers think that certifying crop protection measures will lead to further unnecessary differentiation between European Countries. Farmers feel that the Netherlands try to be the strictest country within the EU (4.25).

Farmers were asked to estimate the degree of compliance within their neighborhood. 58.8% of the farmers estimated that nearly all farmers would fully or nearly fully comply with the SMRs and GAEC requirements. 19.3% of the farmers said that their farm was once inspected by the AID control agency. 36% of the farmers were not themselves inspected, but knew that a neighboring farm was inspected. About 43.9% of the farms was never inspected and did also not know about farms in the neighborhood that were inspected. 92.2% of the farmers indicated that they found it impossible to give a precise percentage estimate of the degree of compliance of the farms in their neighborhood. In the general remarks section of the survey, some farmers indicated that it should be possible to have a “test inspection” by the AID control agency in order to hear from the AID which points on their farm have to be improved. This because some farmers are unsure whether they comply or not with the regulations, although all their efforts and good meanings to keep up with the regulations.

Although there was no separate entry in the survey a number of farmers indicated to be uncertain about being compliant. They would be in favor of having the possibility of a trial inspection in order to be assured or to in time detect deficits. There seem to be some fear about the strictness of the inspection regime as announced in various Information Bulletins sent to farmers by the Ministry of Agriculture, Nature and Food Safety.

Concluding, the two most problematic issues for dairy farmers in the Netherlands are manure and identification and registration of animals. This confirms with earlier expectations. Still further research is needed with respect to a lot of details.

## **9 Estimated degree of compliance**

The degree of compliance will be estimated mainly based on the information returned with the surveys and any other available information (from the inspection annual accounts). Within the survey there are direct questions on compliance, but also indirect ones. For example, sometimes a farmer answers to the direct question that he is fully complying with the Identification and Registration Directive. At the same time elsewhere he answers that in comparison to the past there are additional labor time efforts needed in order to keep the registration system in good order. From this

second answer it can be guessed that his answer to the first question was probably not fully true. This requires still further close analysis.

More detailed information about detected violations by the inspection agencies is discussed in Chapter 12. With respect to the degree of compliance of the animal welfare regulations it should be realized that they will become part of the CC requirements not earlier than in 2007. However, since they are already part of existing law, it was still possible to indicate the state of the art of compliance.

Farmers were asked about the degree of compliance and the extent to which changes in their compliance were induced by the SMRs. When directly asked (nearly) all farmers indicated that they are fully complying. However, when using the indirect method, farmers indicate in a number of cases that they have to make a number of additional (non-regular) efforts to ensure compliance. Based on these answers estimates are made about the degree of compliance before 2005 and after 2005. It should be noted that in some cases farmers are allowed to use some adjustment time before needing to have achieved the final norms (birds and habitat, animal welfare)<sup>5</sup>. In these cases the answer to the direct question (full compliance) could be still consistent with the answer that still additional efforts have to be made in order to achieve full compliance. Moreover, additional efforts can be necessary for reasons of adjustments in the translation of EU standards in terms of the requirements farmers have to satisfy. This latter issue is relevant with respect to the Nitrate Directive (significantly adjusted manure legislation).

Below the main results to the indirect questions about compliance are indicated for the various SMRs and GAECs (see Table 8).

**Table 8** Degree of compliance (using an indirect measurement approach) and impact of CC-requirements on dairy-beef farming measured (in percentages of number of farms of a survey held in the Netherlands in May 2006; number of respondents 115) <sup>\*)</sup>

Theme	Estimated degree of compliance BEFORE 2005 in %	Estimated % of farmers who made CC - induced changes	Estimated degree of compliance AFTER 2005**) in %
Birds and Habitat Directive	85.3	4.6	95.4
Protection of groundwater	81.5	18,5	88.9
Sewage sludge Directive	100.0	0.0	100.0
Nitrate Directive**) )	74.8	30.0	75.0
Identification and registration of bovine animals	75.2	24.8	93.6

<sup>5</sup> Farmers were asked about compliance with the final norms.

Identification and registration of ovine and caprine animals	-	-	-
Plant protection products	-	-	-
Food traceability and food safety***)	70.1	29.9	92.5
Hormones and beta-antagonists	-	-	-
Notification of diseases	86.0	10.3	89.7
Housing of calves	75.7	24.3	90.7
Housing of pigs	-	-	-
Good agriculture and environmental conditions	80.0	35.0	88.6

\*) See main text for the precise meaning of the numbers provided in this table!

\*\*) The final degree of compliance could be higher at the end of 2006. The farmers indicated that they still have to take some measures in order to make full compliance sure.

\*\*\*) Average number reflecting a multiple of specific requirements under this Directive-heading.

As Table 8 shows, except for the Sewage Sludge Directive, for all other SMRs cross compliance induces an improvement of compliance. Some comments are in order here. With respect to the Birds and Habitat Directive (part of) the exact requirements for farmers (management plan) are still unknown and are in the process of being assessed. With respect to the Nitrate Directive it could be added that since January 1, 2006 a new use-norm system for N, P and organic manure has been imposed, which still requires adjustments from farmers. This may explain why a significant number of farmers indicate to not fully comply. With respect to animal welfare (in particular the housing of calves) it should be noted that these regulations are becoming effective under cross compliance no earlier than January 1, 2007.

As Table 8 shows cross-compliance has not only improved compliance, but also induced farmer (from 8% up to 35%) to take measures in order to improve compliance. This has usually not yet resulted in full compliance. Table 9 presents the provisional degree of compliance results for a subset of the arable sector. Also with respect to the arable sector cross-compliance improves compliance and induced farmers (from 10% up to 21%) to take measures in order to improve compliance. Also here this has usually not yet resulted in full compliance.

**Table 9** Degree of compliance and impact of CC-requirements on arable farming measured in percentages of number of farms (based on preliminary survey results Netherlands, June, 2006) \*)

Theme	Estimated degree of compliance BEFORE 2005 in %	Estimated % of farmers who made CC – induced changes	Estimated degree of compliance AFTER 2005**) in %
Birds and Habitat Directive	85.7	4.8	95.2
Protection of groundwater	71.4	14.3	85.7
Sewage sludge Directive	85.7	4.8	95.2
Nitrate Directive**) )	70.3	35.6	91.3
Plant protection products**) )	78.7	21.3	93.0
Good agriculture and environmental conditions**) )	71.6	24.5	88.0

\*) See main text for the precise meaning of the numbers provided in this table and the previous table!

\*) The final degree of compliance could be higher at the end of 2006. The farmers indicated that they still have to take some measures in order to make full compliance sure.

As Table 9 shows, for all SMRs cross compliance induces an improvement of compliance. Some comments are in order here. With respect to the Birds and Habitat Directive (part of) the exact requirements for farmers (management plan) are still unknown and are in the process of being assessed. With respect to the Nitrate Directive it could be added that since January 1, 2006 a new use-norm system for N, P and organic manure has been imposed, which still requires adjustments from farmers. This may explain why a significant number of farmers indicate to not fully comply.

## 10 Estimated costs associated with cross compliance regulations

### 10.1 Introduction

This section addresses the issue of the costs of compliance. Cost estimates are in progress. For calculation procedure the general framework as described in Deliverable D7 will be followed. Information about costs is asked in the survey. First results indicate that it will be possible to provide costs estimates.

With respect to the cost calculation of costs a valuation of the labour hours involved in making plans and other required compliance actions (e.g. placing of eartags). One option could be to get an imputed wage for family labor (what it mainly is) by looking for wage rate for similar labor outside agriculture. Alternatively, one could base the estimate on a close substitute, i.e. the wage rate for hired labor. When this latter route is followed and the average age of the farmer and function differentiation is taken into account, a wage rate of €22 per hour is obtained. However, applying the opportunity cost principle in this way would probably lead to an overestimation of the labour costs. Using farm accountancy data (e.g. Binternet) the realized remuneration of farm labour is much lower. Depending on farm scale, farm type and assumptions used in the calculations values in the range of €2 till €12 per hour of farmer's labour were found<sup>6</sup>. The estimated wage rate was approximated by the average wage rate obtained by family labor in agriculture. Based on this a wage rate €7 per hour will be used in all subsequent calculations involving labor time following below.

In the following for each SMR and GAEC requirement (as far as possible) a cost calculation will be provided. This cost calculation is based on the constraint implied by the specific SMR. However, it needs an additional step to arrive at the additional or extra costs due to Cross Compliance. Since with exception to the GAEC requirements, in the Netherlands no new legislation was introduced theoretically speaking the extra costs should be zero in all cases. However, this presumes full compliance with the existing regulation.

Actually there are three complications which need to be taken into account. Firstly, actual compliance maybe lower than full compliance, and the CC requirements may lead to an increase in compliance, with an associated proportional increase in costs. Secondly, although no new legislation was introduced, there are clear examples of adjustments made in existing legislation while anticipating the coming EU legislation. The Birds and Habitat Directive could be mentioned as an example. Another case is the adjustment of the Dutch manure policy in order to achieve macro-compliance after an infringement procedure initiated by the Commission. Thirdly, the domain of the requirements should be accounted for. Some requirements concern specific agricultural sub sectors (husbandry, arable) or specific areas (e.g. Natura 2000 sites). This requires detailed estimates about the share of these sub sectors or areas in the

---

<sup>6</sup> This was calculated as the as the residual value added remaining after all paid production factors are remunerated. Moreover this amount was corrected for the imputed estimated value for owned land.

total factor input used for production in order to determine the impact on production costs. In some cases an estimate has to be made which part of the additional costs should be attributed to which output (e.g. the jointness in milk and beef production).

## 10.2 Birds and Habitat Directive

In the survey the Dutch dairy farmers indicate that there are at this stage no additional costs involved in satisfying the Birds and Habitat directive. However, about 12% of the farmers indicated that they have to make some labor efforts (median is 1 hour per hectare per year). Moreover, 15.3% indicated that they expected a reduction in the earnings from land rented for hunting. However, it is unlikely that the responding farmers already had a clear idea about the impact of the changes in the (near) future.

Cost to farmers will depend on the impact of the management plans associated with the Bird and Habitat Directive. Because this is still in the implementation phase, at this moment no empirically verified information about the potential yield reduction is available. According to an ex-ante analysis, which is still carried out at LEI, the new restrictions will imply a reduction in nutrient applications from about 200kg N/ha to 100kg N/ha (Reinhard et al, forthcoming).

The yield reduction is valued and considered as the monetary loss or costs per hectare of site subject to the directives. In principle this revenue loss should be corrected for the adjustment in variable costs to get the real net loss. However, for convenience sake the change in variable costs is assumed to be zero. In the ex-ante analysis mentioned before a preliminary estimate of the loss due to yield reduction is about €160/ha (Reinhard et al, forthcoming)

The additional costs for Dutch agriculture are estimated to amount €21 till €33 million per annum<sup>7</sup>. The uncertainty in this costs estimate is mainly coming from the Water Directive, which might require even more strict limitations on nutrient application, which increases the yield reduction and thus costs (preliminary estimate based on Reinhard et al, forthcoming)). It is not yet known to what extent these additional costs might be neutralized by cost-offsetting measures.

## 10.3 Groundwater protection Directive

The main costs for farmers for satisfying this directive appear to be the costs of collection exhausted transmission oils. These costs are estimated by multiplying the average amount of oil that has to be disposed times the disposal costs. On to this costs of time and transportation are added. The cost estimates are mainly based on the survey responses. The amount of oil disposal varies significantly over farms and cannot be approximated simply by the number of tractors available on farm. One reason is that oil refreshment of tractors is often done in garages, which directly

---

<sup>7</sup> The additional costs concept takes into account that a large number of Natura 2000 sites are also under nature conservation programs, which already require a number of management actions, and also include compensatory payments for farmers which in principle covers all costs associated with the required actions (including a small bonus).

collect the oil and charge a cost for this of about 1 euro/liter. However, it was impossible to get number about the money involved in this. Another reason is that farmers which do the oil refreshment on their farm not always dispose the exhausted oil. It is allowed to use this oil for lubricating purposes. This is often done and the exhausted oil is applied in other machinery. Actually this kind of use has a premium for the farmer: the exhausted oil substitutes for alternative lubricants which would have to be bought, and by using the exhausted oil one avoids the disposal costs-levy.

This behaviour leads to a reduction in the disposal and in a large number of cases in the survey zero oil disposal was observed. For example 64.9% of the dairy farmers responding in the survey indicated to have no additional costs. 21.9% of these farmers indicated to have incidental costs, and 13.2% indicated to have annual operational costs varying between € 100 - € 5000 per annum (median € 500).<sup>8</sup> Only 1% of the farmers indicated to have costs associated with the sampling of the sludge and the soil (of around €500).

With respect to the collection of exhausted transmission oil in the Netherlands already a legal provision was made. So farmers should have no additional costs. This fits in with the answers farmers gave to the survey questions about the costs associated with this Directive.

## 10.4 Sewage Sludge Directive

The cost calculation procedure suggested in Deliverable 7 follows the principle of calculating the manure value of sewage sludge and combine this with the amount of sewage sludge which has to be replaced by other alternatives due to the restriction on sludge application.

Sewage sludge contains N, P, Ca, K and Mg nutrients useful for crop growth and other less, non- or even negatively valued ingredients (like heavy metals). In general it holds that sewage sludge is a difficult to define substance and as a consequence nutrient value estimates are strongly varying and often based on a few observations, which might be non-representative.

In Dutch agriculture currently only so-called 'clean' sewage sludge coming from industry, in particular from the food industry, is used. It is estimated that cross compliance will not induce any significant substitution between nutrients derived from sewage sludge by those from alternative fertilizers. This is confirmed by the results obtained from the survey, where 90.3% of the farmers reported to have no additional costs. Only 1% of the respondents in the survey mentioned to have some costs, which than came exclusively from the figures for registration time regarding the Sewage Sludge Directive.

In order to form a basic idea of the role of sewage sludge in Dutch agriculture and its potential value, nutritional N and P values, and application levels are given in Table 10. The value of fertilizer is set equal to the value of mineral fertilizer (abstaining from other value differences). Based on this Table, and assuming a price of N fertilizer of €0.70/kg, the value of sewage sludge as an N-fertilizer amounts about 1.5

---

<sup>8</sup> These estimates should be taken with due care, because farmers might have mixed up (one time) investment expenditure with (annual) investment costs

million euro. As compared to the total nutrient applications the contribution of sewage sludge is very marginal and of negligible order.

Table 10 Sewage sludge application to agriculture

Nutrient	Content (%)	Application to agriculture in million tons (2003)
N	2.0 – 4.0	2.2
P (P <sub>2</sub> O <sub>5</sub> )	0.5 – 1.0	1.4
Organic matter	45.0 – 60.0	34.0

Source: based on Milieucompendium and expert estimates

As with the previous regulation, there seems to be no significant costs, since farmers are already used to the limitations imposed by this directive. This is confirmed by the results obtained from the survey. 90.3% of the farmers reported to have no additional costs. Only 1% of the respondents in the survey mentioned to have some costs, which came exclusively from the figures for registration time regarding the Sewage Sludge Directive.

## 10.5 Nitrate Directive

The Nitrate Directive consists of a number of requirements, among others concerning the amount of manure and fertilizer application, the timing and the equipment used. Several kinds of costs were indicated (which all need further research). Among them are costs for manure surplus disposal, costs to rent additional land in order to be able to place one's manure, costs associated with outsourcing grazing of young animals, and costs associated with manure plan development and record keeping.

From the dairy/beef farmer respondents in the survey about 35.1% of the farmers indicated that they are experimenting with the feed rations, in order to influence the ureum count number (aimed at influencing N excretion by dairy cows).

A quick scan of the respondents in the survey (dairy, beef, and livestock farmers) it seems that all farmers will have or fear to have additional costs due to the Nitrate directive and the adjustments this brought. Moreover, these costs have significant character and are likely to dominate the costs associated with any other SMR. However, it will require further effort to translate the given answers into financial amounts. Only relying on the answers to survey questions, it was not possible to obtain reliable estimates about the magnitude of the additional costs. Therefore in the following we will rely on an ex-ante analysis done by De Hoop et al (2004).

De Hoop et al (2004) estimated the additional costs due to the tightened manure policy for several farm types, farm scales and soil types. Differently from the previous cases the costs associated with the tightened manure restrictions will be

considered all as additional costs. In all cases the old situation (MINAS-system) in 2004 functions as a reference case for the calculations.

The additional costs of the Nitrate directive and the associated tightening of the Dutch manure policy in 2006 for dairy farms are provided in Table 11. The Table provides information about changes in manure disposal costs as well as changes in the net labor return. Both numbers are calculated at per farm level and in terms of the change in costs per 100 kg of milk produced.

The dairy farms are classified according to soil type (sandiness/clay) and production intensity (expressed in terms of kg milk produced per hectare of land). All farms are specialized dairy farms, except for the mixed-class (relatively unimportant). Taking into account the soil composition of the Dutch soil and the location of dairying in the Netherlands also weighted average is calculated for the representative average Dutch dairy farm.

Because over the period 2006-2009 both the use or application norms of kg N/ha, kg P/ha for various soils as well as the effectiveness-coefficients of organic manure are adjusted (lower application allowances, higher effectiveness coefficients) the impacts are calculated for both the years 2006 and 2009.

**Table 11** Costs of Nitrate Directive for dairy farms (in euro)

Soil type and production intensity	manure disposal costs per farm		change in labor return per farm		manure disposal costs/100kg milk		change in labor return / 100kg milk	
	2006	2009	2006	2009	2006	2009	2006	2009
<50% sandy; <14.000kg/ha	900	900	-800	-200	0.17	0.15	-0.15	-0.04
<50% sandy; >14.000kg/ha	2400	3800	-2400	-3000	0.37	0.55	-0.39	-0.46
>50% sandy; <14.000kg/ha	1500	2500	-1300	-1700	0.30	0.45	-0.27	-0.31
>50% sandy; >14.000kg/ha	3600	5800	-3400	-5400	0.63	0.95	-0.59	-0.85
mixed	2200	5300	-1300	-4200	0.54	1.20	-0.31	-0.95
average for all dairy farms	2100	3300	-1900	-2600	0.38	0.56	-0.34	-0.45

Source: own calculations based on De Hoop et al, 2004, 35-36.

As Table 11 shows the average additional costs of manure disposal per dairy farm for 2006 and 2009 are €2100 and €3300 respectively. The additional manure disposal costs at a national scale are approximately €40 million in 2006 and €60 million in 2009. The net impact on the return to labor per farm is smaller than the manure disposal costs, i.e. -€1900 and -€2600 respectively. In terms of the projected average dairy farm's family income of €41000 in 2009 this means a reduction of about 7%. The difference between manure disposal costs and net return to labor change is caused by the allowance for behavioural adjustment of the farmers in the underlying model calculations and the changes in prices. For example the price or costs of milk quota are a bit lower under the new regime. There are also (slight) changes in the crop mix (maize), organic manure/chemical fertilizer ratio, herd composition, etc. Although the calculated numbers provided in Table isolate the pure-manure legislation adjustment effect, in the simulation also the behavioural changes as a

consequence of the Midterm Review agricultural policy change are taken into account. In addition Table 11 shows that the impact strongly varies with the production intensity: the higher the production intensity the higher the costs. As Table 11 further shows dairy farms with a high degree of sandy soils will be more heavily affected than farmers with clay-dominating soil types.

The impacts on arable farms are presented in Table 12. The arable farms are classified according to typical arable regions. Also a national Dutch average is calculated, taking into account the weights of the several areas in total Dutch arable production. As in the case of the dairy farms estimates are given for the years 2006 and 2009. The net change in labor returns due to the pure manure legislation adjustment in 2006 are calculated per farm. The impact on the costs per 100 kg of cereals are estimated taking into account the projected yields (based on winter wheat).

**Table 12** Costs of Nitrate Directive for arable farms

Soil type and production intensity	change in labor return per farm		change in labor return per hectare		projected cereal yields		change in costs per 100 kg cereals	
	2006	2009	2006	2009	2006	2009	2006	2009
Northern clay area	3200	1650	42	22	9000	9400	0.47	0.23
Central clay area	2500	2200	65	57	10100	10200	0.64	0.56
South-west clay area	1000	750	22	16	10000	10200	0.22	0.16
Northern peat colonies area	4750	6850	90	130	8600	8900	1.05	1.46
>75% dry sand	4350	5900	112	151	9300	9500	1.20	1.59
average for all arable farms	2950	3450	62	72	9300	9900	0.67	0.73

Source: De Hoop et al, 2004, 48; Landbouwcijfers 2004 and own calculations

In contrast with the previous case (dairy farmers), the arable farmers in general benefit from the adjusted manure regulation. The main reason is that a lot of additional manure has to be disposed from animal farms, which they can accept at attractive conditions (animal farmers pay arable farmers to accept manure). In 2006 and 2009 this lead to a benefit for the arable farmers of respectively €5000 and €7500 per arable farm. However, at the same time arable farmers are themselves confronted with more strict application standards, which enforces them (over time) to substitute cheap organic manure for relatively expensive chemical fertilizers. Moreover in some cases the manure application will be enforced to a level below the agricultural optimum. As a result of that sometimes the yields will slightly decline (in the used yield projection it is assumed that there will be still a net increase due to the dominating impact of genetical progress). The positive impact of the adjusted manure legislation on the returns to labor for the arable farmers is estimated to dominate the negative impact of the Midterm review, which is estimated to be -€900 (2006) and -€2100 (2009) per farm.

The impact of the Nitrate Directive on the costs for the intensive livestock farms are presented in Table 13. The calculated changes in labor return are nearly the same as the manure disposal costs (not separately reported). The returns to labor for the

average pig farm decline with €5900 in 2006 and €10.400 in 2009. For the average poultry farm the decline in the returns to labour amount €5700 and €6400. The costs per unit of output have been approximated by calculating the national costs (costs per farm times number of farms) and divide this with the total output of the sector. The units used are euro/100 kg of pork (including bones), euro/100 eggs (laying hens) and euro/100kg of broiler meat (live-weight).

**Table 13** Costs of the Nitrate directive for the intensive livestock sector

activity	change in labor return per farm		change in costs per 100 kg of output	
	2006	2009	2006	2009
Breeding pigs	-5900	-9000		
Other pigs	-6500	-11500		
average pigs	-6300	-10400	1.52	2.51
Laying hens	-5900	-6700	0.07	0.08
Broilers	-5400	-5800	0.36	0.39
average poultry	-5700	-6400		

Source: De Hoop et al, 2004, 40, Landbouwcijfers 2004 and own calculations

## 10.6 Identification and registration of animals

Since the identification and registration requirement is pre-existing legislation, in principle the expected additional costs from cross compliance are zero. However, as was indicated by the estimates about the degree of compliance in Section 9, cross-compliance is likely to improve the degree of compliance. As such it might lead to some additional costs. In order to be able to make an estimate of this additional cost, first the costs of identification and registration in general are estimated.

In the survey 91.2% of the dairy-beef farmers report eartag loss rates varying between 10 till 30% (total width reported from 1% tot 75% of the animals present on a certain farm). 75% of the farmers indicated that the total costs of eartag replacement were less than or around € 150 per annum. This estimate excludes the labor effort made by the farmers to put the eartags in place. On average this costs about 7 minutes per animal per replacement.

The annual costs associated with identification and registration are calculated as presented in Table 14. The estimates are provisional and exclude the fixed costs per farm (their impact on the costs per kg of final product will be in general negligible). Data are based on most recent observations (2004), and where missing (see indicated with stars) they are estimated. Animal numbers are based on LEI (2005). The estimated birth rates are estimated based on Landbouwcijfers (2005). The estimated eartag loss rates were based on the results from the survey (see above). With respect to imported animals it is assumed that they already got an eartag in the country of origin, but that they are subject to the same eartag loss rate than domestic animals.

With respect to the live animals exported it is assumed that they get an eartag in the Netherlands, but that they not require eartag replacement due to loss or destruction.

**Table 14** Provisional estimates of the costs for identification and registration of animals \*)

		Dairy cows	Beef & suckler cows	Sheeps and goats	Pigs**)
a	Total population (million)	3.78		1.518	
b	of which adult mother animals	1.47	0.15	0.61	0.912
c	Total output (x 1000kg)	11,075	188	15	1,299
d	Birth rate	0.95	0.90	1.40	24.0
e	Percentage loss of eartags	20%	15%	5%	2%
f	Time spent on animal registration on farm (minutes/animal)?	7+5+3	7+5+3	7+5+3	3
g	Costs of eartags (€/tag) ***)	2.75 (1.75)	2.75 (1.75)	1.35 (0.40)	0.15
	Idem total (mill. Euro)	4.53	0.45	0.73	3.31
h	Labour costs (mill. Euro)	2.34	0.61	1.03	7.40
i	Total costs (mill.Euro)	6.87	1.26	1.76	10.71
j	Idem €/kg product	0.006	0.007	-	0.008

\*) Data for years 2003 and 2004 are used

\*\*\*) Based on own estimates (provisional), no survey information could yet be used.

\*\*\*\*) Number between brackets denotes cost of replacement eartag

The calculation procedure followed is as follows. First the population is determined (taking into account the effect of imports and exports of live animals). The offspring of animals can be determined by multiplying the number of mother animals by the birth rate (this gives the number of new eartags that are yearly needed for newborn animals). To this the new eartags needed due of loss should be added. This number can be calculated by multiplying the population by the loss rate. Adding to this number the number of tags needed for newborn animals gives an estimate of the total number of tags needed. Multiplying this number by the cost per eartag gives an estimate of the eartag costs.

The labor cost are calculated as the wage rate per hour (€7 per hour) times the labor time per animal. The total time involved in I&R is estimated to 15 minutes for registration of newborn animals (excluding pigs), which includes registration by telephone or internet (7 minutes), putting the earmark and associated paperwork with on-farm record keeping (5 minutes), and time involved in regular inspections (3 minutes). For the rest of the animal stock the labor time is estimated to be 50% of that

for newborn animals (up keeping record and regular inspection). For pigs the I&R system works different since they are registrated per batch. Time costs for newborn pigs are estimated to be 3 minutes per animal per year and 1.5 minutes per animal for all other pigs.

The costs per kilogram product are calculated as the costs for eartags and labor divided by the amount of main product produced (milk for dairy cows, beef for meat cows, meat for pigs). For the sheep and goat category no cost per kg product is given due to difficulties to divide costs in a reliable way over milk and meat output.

## **10.7 Public, animal and plant health**

Costs associated with plant protection management plan. Information will come from the survey. The calculation procedure is to calculate the time and hired advisory services costs involved in preparing a plant protection management plan.

Notification of contagious diseases goes with zero costs. It could be the case that a veterinarian check-up is the basis for such a notification. However, the costs of such a check-up are considered as normal veterinarian costs associated with farmers suspecting health problems with their animals.

## **10.8 Animal welfare**

With respect to animal welfare 65% of the dairy/beef farmers expect no additional costs since their housing already satisfies the requirements. About 16.8% of the farmers indicate that part of their housing facilities (on average 4.6%) do not yet satisfy the EU requirements. It should be noted that they will be allowed some time before full compliance is expected. More than 85% of the farmers indicated to expect no additional costs with respect to animal welfare. Where they have to make adjustments it seems possible to easily include them into the regular investment program.

With respect to intensive livestock production the additional costs are also estimated to be rather low. This is due to the Dutch animal welfare legislation with respect to housing which is, as was indicated before, stricter than EU legislation. A lot of the farmers already took the relatively strict Dutch national requirements into account during their past investment decisions, whereas others have already integrated them into there current and future investment plans.

## **10.9 Good agricultural and environmental condition**

With respect to the GAECs 42% of the dairy/beef and arable farmers indicated to have no additional costs involved in respecting the GAEC requirements. It should be noted that these farmers are dairy-beef farmers, which exploit a high share (often 100%) of their land grassland (not very sensitive to GAEC-issues). Further

assessment of the survey results is necessary to detect which kind of costs farmers think are relevant, and what order of magnitude they are.

## **10.10 Concluding remarks**

In the preceding sections cost estimates have been provided about different cross-compliance themes. The estimates provided have for several reasons a provisional character. Firstly, as already stated several times, as far as cross-compliance involves pre-existing legislation it should in principle not lead to additional costs, i.e. costs additional to the costs that should be regularly made to satisfy the pre-existing requirements.

There could be additional costs for new requirements specific to cross-compliance (in particular with respect to the GAECs) and for those areas where either cross-compliance improved the degree of compliance, or the requirements in pre-existing legislation are adjusting because of or anticipating cross-compliance (improvement in macro compliance), or both.

In order to assess the impact of cross-compliance the cost calculations provided in this chapter, which mainly provide an estimates of the total costs involved in each of the SMRs and GAECs (an exception was the Nitrate Directive, for which because of the marked change in the program additional costs were calculated), a correction has to be made for the induced change in the degree of compliance.

Based on the survey some estimates were provided about the induced change in compliance as well as about the current level of compliance. The provided estimates were provisional as a further statistical assessment of the results is still required and not all data are yet analysed. However, the results as processed so far indicate that cross-compliance has a positive impact in improving the degree of compliance. Moreover, it indicated that full compliance might not yet be achieved (see results from indirect measurement approach) even if farmers answer that they fully comply when they are directly asked. However, it is very difficult to assess the exact level of non-compliance since our indirect method of measurement can also report non-compliance because farmers use allowed transition periods before fully satisfying the final standards. A further investigation could be made by looking to the results offered by the official monitoring and inspection agencies (see later section).

Uncertainty about the exact degree of non-compliance, of course hinders the estimation of the additional costs.

## **11 Estimating benefits of cross compliance**

There are several potential benefits from the introduction of cross compliance. A first benefit, already mentioned in Section 9, is the induced increase in the degree of compliance. In this section the focus is on other 'benefits'. A distinction will be made with respect to the benefits as aimed for by the policy authorities (effectiveness) and the benefits as they are perceived by farmers.

With respect to the first the relevant question is to which extent the increased compliance to the SMR and GAEC requirements contributes to the realization of pre-specified policy targets. For example, the Birds and Habitat Directive aims at preserving the population of certain wild birds. The question now arises whether or not the measures undertaken (specified special zones, hunting and disturbance restrictions, management plans on farms) are sufficient to achieve this goal. In principle this requires evaluation studies at SMR level, which are currently only to a limited extent available. As far as Cross Compliance coincides with (unchanged) existing legislation which has been already in place for some time and was already evaluated before, at least some projections can be made. Moreover use could be made of expert information, as far as available.

Information with respect to the benefits as perceived by farmers is relevant for two reasons. Firstly, if farmers have the feeling that their efforts contribute to the intended goals, this is likely to affect their commitment. However, if they have the feeling that they are faced with all kind of restrictions developed top-down at bureaucratic policy headquarters which do not really contribute to the aimed policy goals, it is likely to negatively affect their cooperation. This may even extent to their compliance with requirements which they could satisfy without any costs.

Secondly, asking farmers about perceived benefits at a level of sufficient detail could help to develop ideas for further policy improvements and utilize local knowledge available at grassroots level, and also detect synergy as well as tensions between various policy goals. This latter type of information was asked for in the survey among farmers. Unfortunately, no detailed results are yet available.

## **12 Inspection and enforcement**

### **12.1 Introduction**

In the Netherlands the Ministry of Agriculture, Nature and Food Quality (LNV) is the competent authority for the correct implementation of the control on cross compliance. For the control on compliance with the requirements concerning 'environment', 'public, animal and plant health', and 'animal welfare', several bodies are responsible. Besides the General Inspection Service (AID) of the Ministry of LNV, it concerns the water boards, provinces, municipalities, Transport and Water Management Inspectorate (Inspectie Verkeer en Waterstaat), Netherlands Controlling Authority for Milk and Milk Products (COKZ) and Controlling Office for Poultry, Eggs and Egg products (CPE). Each body exclusively controls that part of the requirements for what it is authorized and responsible. Table 15 gives an overview of the official authorities, which are doing the control of compliance with each EU Directive and Regulation relevant for cross compliance. The requirements are derived from each EU Directive and Regulation. About ninety percent of the EU Directives and Regulations are controlled by the AID. The remaining requirements are controlled by the municipalities, provinces, water boards, COKZ and CPE.

**Table 15** The authorities concerned controlling of compliance with the EU Directives and Regulations regarding cross compliance.

<i>Environment:</i>		<b>Controlled by:</b>
1	Birds Directive	Province and AID
2	Groundwater protection	Municipality
3	Sewage sludge Directive	AID
4	Nitrates Directive	AID and Water Board
5	Habitats Directive	AID and Province
<i>Animal, plant and human health:</i>		
6	Identification and registration of animals	AID
7	Execution Identification and registration of cattle	AID
8	Identification and registration of cattle	AID
8bis	Identification and registration of sheep's and goats	AID
9	Plant protection products	AID
10	General Food Law	AID
10a	Animal feed hygiene	AID
10b	Foodstuffs hygiene	AID
10c	Specific hygiene rules for food of animal origin	COKZ and CPE
11	Substances having a hormonal or thyrostatic action and beta-agonists	AID
12	Foot-and-mouth disease	AID
13	Swine fever	AID
14	BSE	AID
15	Bluetongue	AID
<i>Animal welfare:</i>		
16	Housing of calves	AID
17	Housing of pigs	AID
18	Protection of farmed animals	AID
<i>Good agricultural and environmental condition:</i>		
19	Soil erosion	Province
20	Soil structure and organic matter in soil	AID

Source: Ministry of LNV (2006), *Randvoorwaarden GLB en uw bedrijf. Praktische informatie over de randvoorwaarden van het gemeenschappelijk landbouwbeleid*, brochure, 24 november 2006, Den Haag.

In the Netherlands, approximately 80,000 farmers have to comply with the above mentioned standards in the fields of environmental protection, public health, animal and plant health, animal welfare (see table 15, number 1 till 18).

## **12.2 Selection of the farms**

The European Commission has demands concerning the selection of the farms to be inspected:

1. Minimum control rate: checks must be carried out on at least 1 % of all farmers submitting aid applications under support schemes (article 44, Commission Regulation No. 796/2004).
2. Selection of the control sample: the selection of farms to be checked must be based on a risk analysis. That risk analysis may be based on the level of an individual farm or on the level of categories of farms or geographical zones or on the level of undertakings (article 45, Commission Regulation No. 796/2004).

Since May 2005 the AID has started the inspections in accordance with the EU rules concerning cross compliance. The selection of the 1% of all farmers in the Netherlands to be checked has been based on a risk analysis. The coordinating control authority (CCA) of the AID makes the risk analysis every year. The CCA coordinates the inspections concerning cross compliance in the Netherlands. The CCA is part of the so-called EU-desk of the AID. The basic principle of the risk analysis of the CCA is to find out in which groups of farmers the risk of negative effects on environment, human, animal and plant health and animal welfare is the largest due to non-compliance of cross compliance. 80 percent of the 1% of all the farmers to be selected is based on the risk analysis. The remaining 20 percent is based on a sample taken at random. For the risk analysis the CCA uses information from several sources. Firstly, general information about the farmer (name, address, home, date of birth, gender, legal form etc.) coming from the so-called 'Producers List' (Producentenregister) of the Paying Agency (Dienst Regelingen) of the Ministry of LNV. Secondly, information deriving from the so-called 'Cross tables' (kruisjestabellen) which is part of the account information that has to be given to the European Commission every year because of the approval concerning the European financial support. Besides financial information it concerns information on land surface, crops, payments, farmer, products, control etc. That information is partly present at Dienst Regelingen and partly at the AID itself. Thirdly, the AID uses information about land base, animal stock etc. from the so-called 'Agriculture May Count' (Landbouw meitelling). That information is present at the Dienst Regelingen.

Then the CCA estimates the risks as of every precondition by which information from COKZ and CPE is used. After that the CCA performs a so-called 'target approach' in which all types of farming (arable farming, horticulture, arboriculture, fruit growing, dairy farming, pig farming, poultry farming) are proportional divided. Next the CCA applies a so-called 'regional approach' that considers soil erosion prevention at a farm, whether a farm is located near a Natura 2000 area etc. Eventually the risk analysis results in a list of farms having a high-risk profile and therefore being selected for inspection on the spot.

## 12.3 Cooperation between public authorities

The Ministry of LNV employs the following principles regarding the cooperation with the public authorities concerned:

1. The existing division of competences and enforcement tasks are respected.
2. Existing enforcement policy is respected.
3. The inspection load of the farmer should remain limited as much as possible, therefore combining inspections of several control authorities is preferred.

After the selection the AID informs the other official inspection authorities about the farms which must be inspected. Together with them a schedule is made consisting the date on which each selected farm will be visited by the inspectors of the involved authorities (AID, water board, municipality, province).

## 12.4 On-the-spot checks

In 2005 and 2006 the AID has inspected respectively 935 and 825 agricultural firms on compliance with the requirements concerning cross compliance.

Table 16 gives some insight in the inspections that the AID conducted in 2003, 2004 and 2005 with regard to the national legislation included under the heading of Cross Compliance. The inspection hours presented includes not only the actual duration of the on-the-spot check but also the time for preparation, the journey, reporting etc.

With respect to the Birds and Habitat Directive the inspections concerned mainly hunting practices and the check whether previously granted exemptions to the norm to not disturb protected bird species are respected in an appropriate way.

Regarding the manure policy, as indicated before (see Chapter 3), the Dutch regulation system has been changed in 2006. So inspection results about the manure policy reflect experiences with the old system (MINAS), a system less strict than the new regulations. With respect to manure also violation of the animal rights were checked, clauses which are also part of the revised legislation.

With respect to public, plant and animal health area checks were done on the use of allowed plant protection products, as well as on the 'safety' zones farmers should respect in order to avoid contamination of the surface water with plant protection products. Regarding animal health a lot of inspections were done on the use of veterinary medicines, in particular with respect to hormones. Almost 31,000 hours of inspection in 2004 were spent on checking compliance with animal feed regulations in the compound feed industry (not further reported here).

**Table 16** Compliance inspections of AID: selected results for 2003-2005.

	Inspection in hours		Number of detected offences		
	2004	2005	2003	2004	2005
<i>Birds and Habitat Directive</i>					
Hunting practices	1,300	1,600	11	9	4
Granted exemptions on disturbing protected bird species	1,300	1,885	-	6	4

<i>Manure policy</i>					
MINAS-system	35,500	19,000	379	446	251
Animal rights	25,400	13,650	223	252	258
<i>Plant protection products</i>					
Use of allowed means	29,400	26,720	-	530	554
Respecting free zones to preserve surface water	4,700	7,700		15	28
<i>Animal health</i>					
Hormones and beta-antagonists	45,500	13,640	144	124	153
Animal feed	30,600	12,350	12	30	68
<i>Identification and registration</i>					
Bovine animals	41,200	n.a.	237	268	n.a.
Ovine and caprine animals	7,300	n.a.	340	494	n.a.
Pigs	1,600	n.a.	50	89	n.a.
<i>Animal welfare</i>					
Cattle	1,000	n.a.	45	37	n.a.
Pigs	3,100	n.a.	37	91	n.a.
Sheep and goats	1,200	n.a.	61	5	n.a.
Poultry	70	n.a.	1	2	8
Horses	n.a.	n.a.	9	2	n.a.
<i>Cross Compliance</i>					
Preconditions controls and CCA	n.a.	8,879.	-	-	-.

Source: AID (2005), Annual Report 2004; AID (2006), Annual Report 2005.

Some caution is needed in drawing conclusions from the numbers of violations. The on-farm inspections that are mentioned include cross-compliance but are not always necessarily linked to it in a 'one-to-one' way. In other words, these inspections can also be conducted for other reasons. Moreover, sometimes in the figures not only on-farm checks are included, but also inspections of other parties, such as intermediaries and the transport sector (notably in case of the violations of the identification and registration of pigs).

Unfortunately the presentation of the data of the AID inspection agency does not allow to derive any conclusions about the share of the total number of monitored farms that was not complying. As such this hinders the comparison with the results found from the survey.

### **Spontaneous reporting**

The responsibility for 'spontaneous reporting' non-compliance determined by official inspection authorities, directly results from the concerned EU regulations which are directly stringent for the government and citizens in every member state of the European Union. The most important articles of these regulations are article 3 and 6 of the Commission Regulation No. 1782/2003 and article 45 and 65 of the Commission Regulation No. 796/2004.

In referring to article 45, article 48 of the Commission Regulation No. 796/2004 stated that every on-the-spot check, regardless whether the farmer in question was selected for the on-the-spot check in accordance with the 1% selection, shall be the subject of a control report to be established by the competent control authority. Where the competent control authority is not the Paying Agency, the report shall be sent to the Paying Agency within a month of its finalisation. That means that since 1 January

2005 water boards, municipalities and provinces in the Netherlands are obliged to report non-compliance identified during regular inspections to the AID.

In 2005 in the so-called 'Administrative National Consultation Environment Enforcement' (Bestuurlijk Landelijk Overleg Milieuhandhaving) the Ministry of LNV had come to an agreement on cooperation regarding cross compliance with the Association of Water Boards (Unie van Waterschappen), Interprovincial Consultation (IPO), Transport and Water Management Inspectorate (Inspectie Verkeer en Waterstaat) and Association of Netherlands Municipalities (VNG). The agreement concerns the exchange of information about non-compliance identified during regular inspections from the water boards, municipalities and provinces to the AID.

In 2006 the CCA of the AID has received only a very limited number of spontaneous reports from municipalities. Maybe it is partly a question of difference in the inspection and enforcement of article 25 of the Draining Decree Soil Protection (Lozingenbesluit Bodembescherming) among the 443 municipalities in the Netherlands: different responsible policy departments, difference in risk analysis, difference in priorities in annual policy programming, and difference in the amount of means (people, budget, knowledge) between municipalities.

The CCA has received also a limited number of spontaneous reports from water boards about compliance of article 16 of the Draining Decree for open air breeding and cattle breeding (Lozingenbesluit open teelt en veehouderij). Several water boards did not reported the AID non-compliance of article 16 of the Draining Decree perceived during regular inspections on the spot. Though some water boards have reported offences that were not fixed after expired a given repair time, and repeating offences.

The very limited number of spontaneous reporting of the other public authorities in 2006 till so far is probably partly the result of the limited influence or formal power of the Minister of LNV. Water boards, provinces and municipalities have their own 'governments' with own competences and responsibilities. For the cooperation, particularly in delivering non-compliance information to the AID, the Minister of LNV depends mainly on the willingness of those other public authorities.

## **12.5 Enforcement**

In 2005 the CCA of the AID received approximately 900 files concerning unlawful matters (AID, 2006). The next step is the validation of these files by the CCA of the AID. Then the CCA sends the validated data on to the coordinating control bureau (CCB) of the Paying Agency (Dienst Regelingen). Next the CCB decides whether a reduction of the requested financial support should be applied, and if so, with what percentage rate. A member state has certain discretion in determining the weight of the sanction i.e. the percentage rate of the reduction. Commission Regulation No. 796/2004 states that the sanctions have to be in proportion with the seriousness of the environmental effects due to the non-compliance. In the Netherlands the highness of the reduction is determined in the 'Policy rules for applying a framework of norms concerning the preconditions for the Common Agriculture Policy' (Beleidsregels normenkader randvoorwaarden GLB). The Commission Regulations No. 1782/2003 and 796/2004 have been elaborated in these so-called policy rules.

According to those policy rules the highness of the reduction depends on the seriousness, size, permanent character and repeats of the non-compliance. The seriousness is determined by the goal of the condition broken by the farmer and the degree in which that goal is damaged. In judging the size of a non-compliance the question is relevant whether the non-compliance has influence outside the farm house. And when judging the permanent character of a non-compliance, the length of time in which the effects of the non-compliance remain present, must be determined objectively. A repeat is defined as a non-compliance of the same cross compliance obligation that occurs more than once within a period of three successive years. As of each field of precondition (environment, human, animal and plant health, animal welfare, and good agricultural and environmental condition) the Minister of LNV distinguishes three categories that lead to a reduction percentage of respectively 1, 3 or 5 per cent. For each field of precondition a number of points is given, varying from 1 till up to 3, for each criterion seriousness, size, and permanent character. In case of intentional non-compliance the reduction for that non-compliance with regard to a requirement or standard of cross-compliance, amounts to 20 percent. Based on the mentioned four criteria seriousness, size, permanent character and repeats of the non-compliance, the AID can advise the Minister of LNV to reduce the percentage to no less than 15 percent or to increase that percentage to up to 100 percent. In cases of extreme extent, severity or permanence or where repeated intentional non-compliances have been determined, the farmer can be excluded from that aid scheme for the calendar year in question or can, moreover, be excluded from the aid scheme concerned in the following calendar year or forthcoming years.

Financial support can be requested at one or more paying authorities in the Netherlands. Since October 2006 there is only one coordinating paying agency in the Netherlands: Dienst Regelingen. Beside it there are three so-called 'delegated bodies': Main Product Board for Arable Farming (Hoofdproductschap Akkerbouw), Dutch Dairy Board (Productschap Zuivel), and Product Boards for Livestock, Meat and Eggs (Productschappen Vee, Vlees en Eieren). A reduction as resulting from non-compliance of one of more preconditions CAP is discounted in the decision made by the paying body involved concerning the financial aid. The farmer can make an objection against that decision. If the complaint is declared (partly) unfounded, the farmer can appeal against it to the Trade and Industry Appeals Tribunal (College van Beroep voor het Bedrijfsleven). In the case a farmer has requested financial aid at the Paying Agency, the agency itself determines the reduction and discounts it in the formal disposal concerning the requested financial aid by the farmer. In case the farmer has requested financial aid at one of the delegated bodies, the highness of the reduction is determined by the Paying Agency after which the delegated body discounts the reduction.

More than 400 farmers of the 935 farmers inspected in 2005, that is approximately 0.5 per cent of all 80,000 Dutch farmers receiving financial support of the EC with respect to the CAP, have been cut down from the financial aid they had requested in 2005. In 2006 the Dienst Regelingen informed the 400 farmers with a letter about the reduction in the aid. Most offences (non-compliances) are singular. The main share of all the non-compliances concerns the obligations with respect to identification and registration of cattle. Furthermore it concerns non-compliances regarding the manure policy (riding out prescriptions) and in fewer cases it concerns the obligation to sow set-aside areas with green manure. For almost all concerned farmers the highness of

the reduction amounts to 1 per cent of the financial aid they requested in 2005. A small group of approximately 50 farmers received a larger discount because plural non-compliances were the question with that group.

## 13 Concluding remarks

This report provides an overview of the implementation of all the SMRs and GAECs included in the cross-compliance package into national Dutch law. It also tries to give a brief background about national agricultural and policy context, which contributes to understand the peculiarities of the Dutch situation (in particular with respect to the recent changes in the manure application legislation).

Two important other issues discussed are the degree of compliance and the costs of compliance. With respect to the degree of compliance three approaches could be followed, which were all exploited in this study: 1) ask farmers directly; 2) use indirect ways to measure compliance; and 3) rely on non-compliance statistics of monitoring and inspection agencies. Approaches 1) and 2) are covered by a survey, which was constructed in such way as to allow both direct and indirect compliance measurement (cross-checks). Also information about inspection and monitoring was gathered. Unfortunately the information of these different sources was not easy to compare, and one should for various reasons be cautious to draw definite conclusions about the exact level of non-compliance.

There was evidence from the survey signalling that cross-compliance was effective in that it improved the degree of compliance and stimulated farmers to increase their efforts to achieve compliance.

From the survey it appeared that a number of farmers were unsure about whether they were fully compliant. Several farmers indicated they would like to participate in test inspections. Indirectly this signalled that farmer 'fear' the official inspections and would like to avoid detected deviations (and the associated sanctions).

Whereas the OECD questions the efficiency of cross compliance (OECD, 2004, 7), our results suggest that it is effective (improves compliance) and that the current monitoring and inspection system is perceived to be functional and efficient (although only a small number of farms is sampled this is done in a targeted way).

With respect to the costs of compliance, both the information from the survey as separate ex-ante studies and normative farm specific cost studies were exploited. For each SMR costs estimates are provided. As far as calculations about total costs are given they need to be multiplied by the percentage of non-compliance to arrive at an estimate of additional costs. Moreover, often a number of aggregation issues have to be taken into account (aggregating over farms, specific land sites, etc) in order to arrive from a micro level (farm) to a macro level (per country estimate).

Although uncertainties remain and some kinds of information was lacking, it is clear that for the Netherlands the main directive leading to additional costs is the Nitrate Directive. This cost increase is due to the recent changes in the legislation in this field

made by the Dutch government in order to achieve macro compliance (the old MINAS manure legislation appeared not to satisfy EU requirements).

The second SMR which farmers ranked to be most difficult to satisfy was the identification and registration requirement.

For a balanced costs assessment it is advisable to also take into account the role of voluntary standards and certification schemes, which interact with cross-compliance standards (sharing common requirements, different agencies inspecting on same standards, farmers keeping records for both cross-compliance and certification standard reasons, etc.). This aspect will be further analysed in Deliverable 6.

## References

- AID (2005), *Jaarverslag 2004*, Ministerie van LNV, Kerkrade.
- AID (2006), *Jaarverslag Algemene Inspectiedienst. 2005 in Vogelvlucht*, Ministerie van LNV, Kerkrade.
- Boerderij (2005), *LNV verwacht rechtszaken cross compliance*, 15 september 2005.
- Boerderij (2006), *De harde feiten van de cross compliance*, 21 april 2006.
- Dienst Regelingen (2006), *Gevolgen randvoorwaardenkorting blijven beperkt*, persbericht, 19 april 2006, Assen.
- Hoop, de D.W., H.H. Luesink, H. Prins, C.H.G. Daatselaar, K.H.M. van Bommel and L.J. Mokveld (2004) *Effecten in 2006 en 2009 van Mestakkoord en nieuw EU-Landbouwbeleid*. The Hague, LEI, Rapport 6.04.23.
- LEI (2006) *Land- en tuinbouwcijfers 2005*. The Hague.
- LEI (2006) *Landbouw-economisch bericht 2005*. The Hague.
- LEI (various years) *Landbouw-Economisch Bericht*. The Hague.
- LNV Infoloket (information website for Dutch farmers containing agricultural policy information). URL <http://www.hetloket.nl> The Hague, Dutch Ministry of Agriculture, Nature and Food Safety.
- LNV(2004) *Infobulletin: Gemeenschappelijk landbouwbeleid*. The Hague, December, 2004, No.1.
- LNV, 2005. Concept-Natura 2000 doelendocument – hoofddocument. The Hague.
- LNV 2005a *Concept –Natura 2000 Doelendocument* (hoofddocument+ bijlage document). The Hague
- LNV, 2005b *Gebiedendocument*,. p.m.
- LNV 2005c *Natura 2000 Countourennotitie: Kaders voor Natura 2000-doelen, besluiten en beheersplannen*. The Hague, Dutch ministry of Agriculture, Nature, and Food Safety.
- LNV(2005d) *Infobulletin: Gemeenschappelijk landbouwbeleid*. The Hague, March, 2005, No.3.
- LNV(2005e) *Infobulletin: Gemeenschappelijk landbouwbeleid*. The Hague, December, 2005, No.7.

- LNV (2005f) *Infobulletin Mest 2006*. The Hague, July, 2005, No.1.
- LNV (2005g) *Infobulletin Mest 2006*. The Hague, September, 2005, No.2.
- LNV (2005h) *Randvoorwaarden GLB 2005*. The Hague.
- LNV (2006) *Randvoorwaarden GLB 2006*. The Hague, April 2006.
- LNV (2006a), *Randvoorwaarden GLB en uw bedrijf. Praktische informatie over de randvoorwaarden van het gemeenschappelijk landbouwbeleid*, brochure, 24 november 2006, Den Haag.
- LNV (2006b), *Randvoorwaarden GLB (cross-compliance)*, Directie Juridische Zaken en Directie Landbouw, 21 april 2006, Den Haag.
- LNV (2007), Mondelinge communicatie, J.M. Brand, 19 februari 2007.
- MNP (without year) Milieucompendium. URL <http://www.mnp.nl/mnc/index-nl.html>
- OECD (2004) *Agriculture and the Environment: Lessons learned from a decade of OECD work*. Paris.
- Reinhardt et al (forthcoming) *Additionele kosten en sociaal-economische gevolgen van Natura 2000: een quick scan*. Tussenrapportage.
- Roest de K, E Corradini and F. Brouwer (2006) Framework for analysis of the cost of compliance (Deliverable D7). CROSS-COMPLIANCE, Facilitating the CAP reform: Compliance and competitiveness of European agriculture (STREP, Project no. SSPE-CT-2005-006489).
- Silvis, H and K. de Bont (without year). *Perspectieven voor de agrarische sector in Nederland*. The Hague, LEI.
- Staatscourant (2006), *Beleidsregels normenkader randvoorwaarden GLB*, 2 augustus 2006, nr. 148.
- Staatscourant (2006), *Wijziging Beleidsregels normenkader randvoorwaarden GLB*, 20 december 2006, nr. 248.
- Vlioger, de J. J, S.T. Goddijn, H.H.W.J.M. Sengers, C.W.G. Wolf and P.T.M. Ingenbleek (2005) *Ketenpartijen over dierenwelzijn en dierenwelzijnsindex*. The Hague, LEI.

Note: Government documents (see LNV) are all accessible via the website of the Ministry of Agriculture, Nature and Food Safety (LNV), URL <http://www.hetloket.nl>